

Revision of the myrmicine ants of the *Adelomyrmex* genus-group (Hymenoptera: Formicidae)

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ABSTRACT

A revision of the myrmicinae ants of the *Adelomyrmex* genus-group is made. This group is recognized in workers and females by a combination of: antennae of 12 segments with club of 2 segments, median portion of clypeus forming a longitudinal platform and the lamelliform setae in the internal border of the mandibles. This last trait, unknown in other ants, is proposed as autapomorphy for the *Adelomyrmex* genus-group. The group contains two genera, *Adelomyrmex* Emery, 1897 (Neotropics, New Guinea, Fiji, Samoa) and *Baracidris* Bolton, 1981 (Africa), with 26 species (12 described as new) as follows: *Adelomyrmex betoi* Fernández **sp.n.** (México); *A. biroi* Emery, 1897 (New Guinea), *A. boltoni* Fernández **sp.n.** (Brazil and Paraguay); *A. brevispinosus* Fernández, 2003 (México and Costa Rica); *A. costatus* Fernández **sp.n.** (Colombia); *A. cristiani* Fernández **sp.n.** (Colombia); *A. foveolatus* Fernández, 2003 (Costa Rica); *A. grandis* Fernández **sp.n.** (Colombia); *A. hirsutus* Mann, 1921 (Fiji Islands); *A. laevigatus* MacKay, 2003 (Costa Rica); *A. longinodus* Fernández & Brandão **sp.n.** (Brazil); *A. longinoi* Fernández **sp.n.** (México and Costa Rica); *A. mackayi* Fernández **sp.n.** (México); *A. micans* Fernández, 2003 (México); *A. microps* Fernández, 2003 (Costa Rica); *A. minimus* Fernández, 2003 (Costa Rica); *A. myops* (Wheeler, 1910) (Guatemala to Colombia); *A. robustus* Fernández **sp.n.** (México); *A. samoanus* Wilson & Taylor, 1967 (Samoa); *A. silvestrii* (Menozzi, 1931) (Mesoamerica); *A. striatus* Fernández **sp.n.** (Brazil); *A. tristani* (Menozzi, 1931) (México to Colombia); *A. vaderi* Fernández **sp.n.** (Colombia); *Baracidris meketra* Bolton, 1981 (Nigeria), *B. pilosa* Fernández **sp.n.** (Kenya and Gabon); *B. sita* Bolton, 1981 (Gabon). A key to workers of genera and all species is provided, with illustrations of most of them. The first queen for American *Adelomyrmex* and the first male of *Adelomyrmex* are described. The distribution of the group suggests an ancestor that lived in Gondwana before the splitting off of Africa and also suggests that ants could have originated earlier than the known fossil record.

Key words: Taxonomy, identification, key, Formicidae, Myrmicinae, *Adelomyrmex* genus-group

INTRODUCTION

Myrmicinae is the most diverse ant subfamily in genera and species (Bolton, 1995). This diversity is a partial explanation of the inadequate understanding of the phylogenetic rela-

tionships of the included tribes and genera (Bolton, 1987). A reconstruction for the phylogeny of supraspecific taxa has not been offered recently. However, from the 1970's the monophyly and systematics of some tribes has been postulated and studies have been conducted on Tetramoriini (Bolton, 1976), Solenopsidini (Bolton, 1987), Stegomyrmecini (Diniz, 1990), Attini (Schultz & Meier, 1995), Dacetini tribe-group (Bolton, 1998, 1999), Dacetini (Bolton, 2000), Cephalotini (Andrade & Baroni Urbani, 1999), Basicerotini (Dietz, in preparation) and Ochetomyrmecini (Fernández, 2003). These contributions are disentangling, step by step, the puzzle of the phylogeny of this megadiverse and morphologically complex subfamily. In this contribution I propose an informal genus-group to accommodate two previously described genera, *Adelomyrmex* and *Baracidris* Bolton, doubtfully assigned to Stenammini (Bolton 1994, 1995), and provide a revision of all known species.

The genus *Adelomyrmex* is known from the Neotropical and Australian-Pacific Regions with 12 described species (Bolton, 1995; Fernández & MacKay, 2003), while *Baracidris* (Bolton, 1981) is a genus with 2 described species from Central and Western Africa. Bolton (1981) suggested that *Baracidris* is close to *Adelomyrmex*, based on the shared possession of antennae 12 segmented with 2 segmented club, and established the differences between both taxa. However, this suggested proximity was not reflected in the classification of the subfamily.

I propose that both genera form a monophyletic group and I redescribe *Adelomyrmex*. A revision of all known species of the group is provided, including the description of new species.

TAXONOMIC HISTORY

The taxonomic history of the group is short. Emery (1897) proposed *Adelomyrmex* to accommodate a single species, *A. biroi* from New Guinea. Wheeler (1910) described the genus *Apsychomyrmex* for a Mesoamerican species, *A. myops*. Smith (1947) later reviewed this genus. Kempf (1972) placed *Apsychomyrmex* as a junior synonym of *Adelomyrmex*. Mann (1921) proposed *Arctomyrmex* as a subgenus of *Adelomyrmex*, a name synonymized under *Adelomyrmex* by Bolton (1994). Bolton (1981) described *Baracidris* and suggested its close relationship with *Adelomyrmex*.

Forel (1917) placed *Adelomyrmex* and *Apsychomyrmex* in the tribe Leptothoracini. Kempf (1972) put *Adelomyrmex* in the tribe Leptothoracini; Hölldobler & Wilson (1990) left *Adelomyrmex* and *Baracidris* without tribal assignation, and Bolton (1994) placed both genera provisionally in Stenammini.

METHODS

Observations of pinned specimens were made using a Nikon SMZ 2T stereomicroscope at 80X magnification and a fiber ring lamp. Sclerites that were dissected for study with the Scanning Electron Microscope (SEM) were coated with gold to a thickness of 100Å, using a Nanotech gold sputter coater, and after examination, were glued to cards pinned beneath the specimens from which they were removed. Photographs of isolated sclerites or articulated parts of various tagmata were taken with a JEOL JSM 6301 field emission SEM. Line drawings were prepared by using a grid in the Nikon SMZ 2T stereomicroscope at 80 magnifications.

Paratype workers from SHIFT Program (a program for leaf litter ants conducted by Manfred Verhaagh) were collected from soil samples (cubes with sides of 30 cm) subjected to Berlese funnels for 24 hours, and kept in 70% ethanol. Two paratype workers were cleaned in acetone using a Thorton ultra-sound for two minutes, critically point dried in acetone and coated with gold in a Balzer sputter coater for 90 seconds at 50 mA.

Measurements were made using a Nikon SMZ 2T stereomicroscope at 80X magnification and a fiber ring lamp. All measurements in mm:

HL: Head length: Maximum length, in full face view, from the apex of the bidentate clypeal plate to middle of vertex.

HW: Head width: Maximum width in full face view (in males including eyes).

EL: Eye length: Maximum diameter of the eye.

SL: Scape length (excluding basal condyle), in straight line distance.

WL: Weber length: In lateral view of mesosoma, from posteroventral corner of mesosoma to farthest point on anterior face of pronotum, excluding neck (Kugler, 1994).

GL: Gaster length.

TL: Total length.

CI: Cephalic index: HW/HL.

SI: Scape index: SL/HW.

In the taxonomic section, the generic characters are not repeated in the species diagnosis. Conventions: w = worker, q = queen, m = male.

Depositories

BMNH Natural History Museum, London, England.

CWEM W.P. MacKay Insect Collection, University of Texas, El Paso, Texas.

CEPLAC Centro de Pesquisas do Cacau, Comissão do Plano de Lavoura, Itabuna, Bahia, Brazil.

IAvH Insect Collection, Instituto Humboldt, Claustro de San Agustín, Villa de Leyva, Colombia.

- ICN Insect Collection, Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá D.C., Colombia.
- IEXM Insect Collection, Instituto de Ecología, Xalapa, México.
- IMLA Instituto Miguel Lillo, Tucumán, Argentina.
- INBio Instituto Nacional de Biodiversidad, San José, Costa Rica.
- INPA Instituto Nacional de Pesquisas da Amazonia, Manaus, Brazil.
- JTL John T. Longino Collection, Evergreen College, Washington, USA.
- LACM Los Angeles County Museum of Natural History, Los Angeles, USA.
- MCZ Museum of Comparative Zoology, Harvard University, Cambridge, USA.
- MIZA Instituto de Zoología Agrícola, Facultad de Agronomía, Universidad Central de Venezuela, Maracay, Venezuela.
- MZSP Museu de Zoologia, Universidade de Sao Paulo, Brazil.
- PSW Phillip S. Ward Insect Collection, University of California, Davis, USA.
- SMNK Staatliches Museum für Naturkunde Karlsruhe, Karlsruhe, Germany.
- USNM United States National Museum of Natural History/Smithsonian Institution, Washington D.C.

TAXONOMIC SYNOPSIS

Adelomyrmex genus group. Neotropics, Samoa, Fiji, New Guinea, Central Africa.

- Adelomyrmex betoi* Fernández. México. **NEW SPECIES.**
- A. biroi* Emery, 1897. New Guinea.
- A. boltoni* Fernández. Brazil and Paraguay. **NEW SPECIES.**
- A. brevispinosus* Fernández, 2003. México and Costa Rica
- A. costatus* Fernández. Colombia. **NEW SPECIES.**
- A. cristiani* Fernández. Colombia. **NEW SPECIES.**
- A. foveolatus* Fernández, 2003. Costa Rica.
- A. grandis* Fernández. Colombia. **NEW SPECIES.**
- A. hirsutus* Mann, 1921. Fiji Islands.
- A. laevigatus* MacKay, 2003. Costa Rica.
- A. longinodus* Fernández & Brandão. Brazil. **NEW SPECIES.**
- A. longinoi* Fernández. México and Costa Rica. **NEW SPECIES.**
- A. mackayi* Fernández. México. **NEW SPECIES.**
- A. micans* Fernández, 2003. México.
- A. microps* Fernández, 2003. Costa Rica.
- A. minimus* Fernández, 2003. Costa Rica.
- A. myops* (Wheeler, 1910). Guatemala to Colombia.
- A. robustus* Fernández. México. **NEW SPECIES.**
- A. samoanus* Wilson & Taylor, 1967. Samoa.

- A. silvestrii* (Menozzi, 1931). Mesoamerica.
A. striatus Fernández. Brazil. **NEW SPECIES.**
A. tristani (Menozzi, 1931). México to Colombia.
A. vaderi Fernández. Colombia. **NEW SPECIES.**
Baracidris meketra Bolton, 1981. Nigeria.
B. pilosa Fernández. Kenya and Gabon. **NEW SPECIES.**
B. sitra Bolton, 1981. Gabon.

TAXONOMIC ACCOUNT

Adelomyrmex genus-group (Figs. 1–77)

Genera included: *Adelomyrmex* Emery and *Baracidris* Bolton.

Diagnosis. Myrmicine ants with the following combination of characters:

Mandibles with 4 to 6 teeth in the masticatory margin.

Internal side of mandibles with a row of 2–3 to 5–6 hairs modified as lamelliform setae.

Clypeus with raised median longitudinal plate, ridge or strip.

Palpal formula 2,2 or less.

Frontal lobes not extending posteriorly as frontal carinae.

Antennal scrobes absent.

Antennae 12 segmented, with club 2-segmented.

Propodeum angulated or armed with teeth.

U-shaped sulcus in the basalmost portion of the first abdominal tergum.

Monomorphic.

Discussion. Two features noted above and setation of the clypeus require some discussion. The most interesting character, evidently an autapomorphy for the group, is the presence of modified setae on the internal face of the mandibles. Most ants exhibit setae on the internal face of the mandibles, mainly in form of a parallel row near the masticatory margin (Figs. 1, 2, 3). This configuration is more or less general in ants, with some few setae scattered or diffuse (Ponerinae, Pseudomyrmecinae, Formicinae, Myrmicinae). For *Adelomyrmex* genus group, there is an important difference: these setae are lamelliform, transparent, varying in length and shape (Figs. 4, 5), from narrow and long to triangular or subtriangular. These lamelliform setae are very small and transparent, which makes their observation difficult with traditional magnification and light. Moreover, they need to be viewed from certain angles with particular light incidence. Also, in the ants normally mounted with mandibles closed, the internal setae are not visible. Only with the SEM pictures are the lamelliform setae easily visible (Figs. 4, 5) as a result of the gold coating.

The size and position of the lamellae suggest that these are modified setae, as stated below. These modified setae are very flexible, because in specimens with closed mandibles these structures bend on the integument. When a previously dry specimen is damp-

ened and is mounted with open mandibles, the setae return to their erect position without breaking. The function of these structures is unknown, although they could be implicated in some type of sensorial specialization. Longino (1997) speculates about some kind of special prey for *Adelomyrmex*, based on the clypeomandibular configuration (lateral clypeal teeth opposed to teeth in basal margin of mandible, Fig. 9). Unfortunately we do not know what these ants eat.

In some *Adelomyrmex* species the modified setae are parallel to the occlusal border, with few or none near the basal tooth of the basal margin. In other species, seemingly, the setae are located more toward the basal margin of the mandible or are limited to two on the internal face of the basal margin, between the tooth of basal margin and the basal tooth of occlusal margin.

Although the U-shaped sulcus in the most basal portion of the first tergum (Fig. 6) may be a synapomorphy for the group (Bolton, pers. comm.), this structure is only shallowly impressed in some species. In workers of some other myrmicine genera (e.g. *Myrmica* sp., *Meranoplus mucronata*) a similar structure is evident, and in the females of Solenopsidini this sulcus is very deep. However, most myrmicines examined lack this sulcus (e.g. *Myrmica*, *Hylomyrma*, *Monomorium*, *Megalomyrmex*, *Solenopsis*, *Ochetomyrmex*, *Tranopelta*, *Pheidologeton*, *Atopomyrmex*, *Colobostruma*, *Daceton*, *Pheidole*, *Aphaenogaster*). I postulate that this trait has evolved more than once in Myrmicinae.

The genus *Adelomyrmex* exhibits an apical median seta on the clypeus, distinguished from the other clypeal setae, which I postulate as an apomorphic condition, but ancestral for the group. Nonetheless, the other genus of the group, *Baracidris*, lacks this feature (at least the seta was not apparent at 200 X), which I believe to be a loss. Its absence could be a consequence of the reduction of the median clypeal fringe. However, if the clypeal configuration in *Baracidris* and some *Adelomyrmex* (*A. biroi* and *A. hirsutus*) is postulated to be ancestral, that is to say, the median portion of the clypeus represented merely by a narrow fringe, and the configuration in the species of the genus *Adelomyrmex* is the derived condition, it can be thought that a central seta is an apomorphy for this genus alone, rather than for the *Adelomyrmex* genus-group.

The *Solenopsis* genus group possesses an apical clypeal seta projected forward (Bolton, 1987). However, this group exhibits other traits (number of antennomeres in antennae and antennal club) that excludes the possibility of the inclusion of *Adelomyrmex* (and *Baracidris*) in the group. The median clypeal seta is also observed sporadically in some Stenammini. Because the nearest tribe to Solenopsidini seems to be Pheidologetonini (Bolton, pers. comm.), which lacks the central clypeal seta, I postulate that the presence of a central seta could be a convergence among Solenopsidini, *Adelomyrmex* genus group and some Stenammini.

How could a central seta have evolved in *Adelomyrmex*? In the ancestral situation we can imagine a continuous, flat clypeus with a row of apical setae of similar size (as in *Myrmica* or *Tetramorium*, Fig. 1). When the median bulge of the clypeus developed, some of

these setae "migrated" to different positions, leaving one of them as central, accompanied at sides by paracarinal setae (Ettershank, 1966). In Solenopsidini the clypeus does not present the degree of modifications as in *Adelomyrmex* genus group; so the presence of a central seta must have an independent origin in this group. The same may be stated for those few Stenammini that possess a central clypeal seta.

Geographical distribution. The range of the *Adelomyrmex* genus-group includes the Neotropical and Afrotropical Regions, New Guinea, toward the eastern end of the Oriental Region, and the Samoan and Fijian archipelagoes in Oceania. See "Biogeographical Considerations", below.

Key to genera of *Adelomyrmex* genus-group

- 1 Basal border of mandible with tooth (as in Fig. 54); apical clypeal seta usually present (as in Fig. 9) and hypostomal bridge with median tooth as in (Fig. 29) **or** petiolar node low, poorly differentiated (Figs. 64, 65); Neotropics, New Guinea, Fiji, Samoa *Adelomyrmex* Emery
- Basal border of mandible unarmed (Fig. 69); apical clypeal seta absent or not noticeable (Fig. 69); hypostomal bridge simple; node of petiole high (Fig. 69); West and Central Africa *Baracidris* Bolton

Genus *Adelomyrmex* Emery

Adelomyrmex Emery, 1897:590. Type species: *Adelomyrmex biroi* Emery, 1897 (monobasic). Kempf, 1972:18 (Checklist of Neotropical species). Bolton, 1994:106 (Preliminary tribal assignment). Bolton, 1995:58 (World catalog).

Apsychomyrmex Wheeler, 1910:261. Type species: *Apsychomyrmex myops* Wheeler (monobasic). Emery, 1922:268; Smith, 1947: 468–473 (partial revision). Kempf, 1972:18 (as junior synonym of *Adelomyrmex*).

Arctomyrmex Mann, 1921:457 (as subgenus of *Adelomyrmex (sensu lato)*). Type species: *Adelomyrmex hirsutus* Mann (monobasic). Brown, 1973:178 (provisional junior synonym of *Adelomyrmex*). Bolton 1994:106 (synonymy confirmed).

Adelomyrmex includes some of the least known myrmicine ants, which are rare in insect collections. The queen was unknown to date in the New World, and the male was unknown to date in the World. Little of the way of life of the species is known.

Notes about synonymy and taxonomic history. The myrmicine ant genus *Adelomyrmex* was previously known from the Neotropical and Oriental Regions, with 12 species (Fernández & MacKay, 2003). The Neotropical species were formerly in the genus *Apsychomyrmex* (described by Wheeler in 1910), with the sole species *Apsychomyrmex myops*,

based on a single worker from Guatemala. Menozzi (1931) described two new species, *A. silvestrii* and *A. tristani*, from Guatemala and Costa Rica respectively. Smith (1947) offered a synthesis of the systematics, way of life and geographical distribution of this genus, redescribing taxa and expanding the known ranges of some species. In this paper, Smith (1947) suggested the possibility of the presence of *Apsychomyrmex* in México and South America. Kempf (1972) in his Neotropical catalogue, synonymized *Apsychomyrmex* and *Adelomyrmex*, following a suggestion of W.L. Brown, who did not provide formal justification for that proposal. Authors have followed Kempf's arrangement (i.e., Brown, 1973; Hölldobler & Wilson, 1990; Bolton, 1994, 1995). The Western Pacific islandic species *Adelomyrmex hirsutus* Mann and *A. samoanus* Wilson & Taylor were initially placed in the subgenus *Arctomyrmex* Mann.

Recognition. The basal mandibular tooth isolates *Adelomyrmex* not only from its close relative, *Baracidris*, but from most other myrmicines (*Perissomyrmex* possesses teeth in the basal margin, but this is a very distant genus [Longino & Hartley, 1994]). In some workers of *A. tristani* and *A. silvestrii*, this tooth is hardly noticed, but this may be interpreted as secondary reduction.

Diagnosis. *Adelomyrmex* is defined by at least three traits postulated to be synapomorphic, that establish the putative monophyly of this taxon.

(1) Clypeal structure: elevated medially, in form of a very narrow longitudinal platform, with sharply delimited lateral borders (Figs. 9, 16, 22, 26, 47, 48, 54). From this median platform the clypeus is sloped laterally in form of a concavity each side, and in lateral view forms a ventral concavity (e.g. Fig. 15). The anterior clypeal border, in the elevated portion, is formed in some taxa as a slightly or distinctly defined bidentate projection (as in Fig. 9), the **median clypeal teeth**. The anterior clypeal margin possesses, in most species, a pair of teeth, one on each side of the median projection, generally close and opposed to the teeth of the basal margin of mandibles (e.g. Figs. 9, 22, 29), the **lateral clypeal teeth**.

(2) Number and disposition of the clypeal setae: one apical (sometimes replaced with a pair of apical setae), which is projected laterally, and two pairs of paracarinial setae, the first pair inserted near the lateral borders of the clypeal platform and the second laterally from the sides of the clypeus (Figs. 16, 22). The clypeal area possesses other setae, but in some species, number and conformation vary among the included species. The pattern of the clypeal setae (an apical and two paracarinial setae) is constant in all species studied.

(3) Mandibles with a tooth near the proximal quarter of the basal margin. In general it is followed by a hiatus or notch of variable size (Figs. 22, 54). In most of the species these teeth are (with the closed or almost closed mandibles) opposed to the teeth of the anterior clypeal margin (the lateral clypeal teeth). Additionally, the palpal formula is 2,2 or less (Fig. 59).

Description. With character states of *Adelomyrmex* genus-group, modified as follows.

Worker. Monomorphic, length from 1.80 to 4.2 mm. Body variously sculptured, from

striate to coarsely reticulorugose. Erect or suberect setae on body, shorter and appressed on antennae and legs.

Head longer than wide, with posteriolateral corners rounded, and posterior margin slightly convex, flat, or slightly concave. Clypeus pronouncedly raised or elevated medially as a narrow longitudinal plate. Clypeus with median apical to slightly subapical seta long, projected laterad, also two lateral and two dorsal long setae posteriad apical seta. In side view clypeus concave ventrally. Anterior clypeal margin with two teeth near and opposing basal mandibular teeth. Frontal carinae distinct, closely approximated, with elongate and impressed area between them, extended to clypeal plate. Antennae 12 segmented, with 2-segmented club. Eyes relatively small, with 3 to 30 facets, situated slightly anterior middle of head. Mandible with 4 to 7 teeth, with distinct tooth on basal margin, near to proximal quarter, in full face view opposing lateral clypeal teeth. Hypostomal tooth present, except in *A. boltoni* and *A. longinodus*. Palpal segments 2,2 or 1,1.

Promesonotum convex, without promesonotal suture. Metanotal groove distinct to indistinctly impressed. Propodeum with two spines. Propodeal spiracle round and at some distance from propodeal margin. Propodeal lobe subtriangular, rounded. Legs moderately stout, both middle and hind tibiae without spurs. Petiole distinct, campaniform to pedunculate; petiole with several ventral transverse rugae; postpetiole with conspicuous ventral transverse rugae (appearing in profile as toothlike projection).

Gaster oval (in one species with anterior angulate emarginations). Gaster smooth and shining to subopaque. Black to light brown in color. Sting large.

Queen (Fig. 42): As worker, differing from workers in the normal myrmicine queenly traits. General body size as in worker in some species. Ocelli three; anterior ocelli in fossae. Eyes with more than 120 facets. Anterior promesonotal area smooth and shining, posterior area sculptured. Most of katepisternum smooth and shining. Wings as in figure 43, densely and finely setose.

Male (previously unknown, based on *A. vaderi*, Figs. 43, 44). With general traits of myrmicine males. Surface sculpture: promesonotum, major areas of sides of mesosoma and gaster smooth and shining, promesonotum with several punctures; head, mesonotum, propodeum (lateral and dorsal surfaces), petiole and postpetiole irregularly rugulose, postpetiole devoid of ventral transverse carinae. Anterior border of head, and propodeal, petiolar and postpetiolar dorsum with transverse trend.

Pilosity: body abundantly setose. Head, dorsum of mesosoma, petiole, postpetiole and gaster with conspicuous suberect long setae, those of petiole and postpetiole more appressed; in full face view, several long setae oriented outward and anteriorly from clypeal area; antennae densely covered with short, decumbent setae; numerous short, erect setae on eyes; mandibles with long curved setae directed outward and forward.

Head hemispheric. Clypeus medially protuberant, convex. Frontal carinae only partially covering antennal insertions. Eyes large, globose, with numerous facets (>30 in maximum diameter). Three ocelli, prominent and sphaerical. Antennae 13-segmented,

flagellomeres increasing in size from scape to apex, without evident club; scape less curved than in workers, surpassing conspicuously border of vertex. Labrum exposed. Mandibles simple, pointed. Palpal formula (in situ) 2,2. Propodeal spiracle opening shifted posteriad and laterad. Propodeum without spines. Wings (Fig. 43) densely setose, but less than in females. Petiole subcampaniform, with node evenly meeting in rounded summit, postpetiole dome-shaped.

Geographical distribution. *Adelomyrmex* is represented in the Neotropical Region by 23 species ranging collectively from northern México to southern Brazil and Paraguay, but absent from Chile, in the south, and from the West Indies, in the Caribbean Basin. The three species of the Old World inhabit islands (Fiji, Samoa and New Guinea) more or less near the Australian continent. Initially the genus was divided in several species-groups (e.g. Fernández & MacKay, 2003; however, a recent cladistic analysis (Fernández, unpublished) failed to support any of these groups. Then, for time being is not desirable to propose groups until more analysis can be made.

Key to the species (workers):

- 1 Head and dorsum of promesonotum smooth and shining (as in Figs. 57, 58, 60) 2
 - Head and promesonotum at least partly sculptured with striae, rugulae or punctures (as in Figs. 8, 11, 23, 28, 49, 56) 4
 2(1) Petiole with node low (Figs. 57, 64, 65); propodeal spines large (Figs. 57, 64, 65); lateral clypeal teeth absent or not visible (Fig. 58) 3
 - Petiole with node high, shorter (as in Fig. 12); propodeal spines reduced to angles; lateral clypeal teeth present; México *A. micans* sp.n.
 3(2) Propodeal dorsum and sides smooth; Brazil..... *A. longinodus* sp.n.
 - Propodeal dorsum and sides with longitudinal rugulae; Brazil and Paraguay
*A. boltoni* sp.n.
 4(1) Most of promesonotum and first gastral tergum with coarse punctures; Old World 5
 - Promesonotum at least partly with striae and/or rugulae; gaster without coarse punctures; New World 7
 5(4) Propodeal spines large, stout (Fig. 66); New Guinea *A. biroi*
 - Propodeal spines small (Figs. 67, 68)..... 6
 6(5) Head with longitudinal striation; eyes reduced to a few ommatidia; mesosoma in lateral view as in figure 68; Samoa*A. samoanus*
 - Head punctate; eyes reduced to dark spots; mesosoma as in figure 67; Fiji
*A. hirsutus*
 7(4) Mesosomal dorsum with small to large areas smooth and shining (as in Figs. 49, 56) 8
 - Mesosomal dorsum always sculptured throughout (Figs. 11, 17, 23, 28, 39, 40) ..

- 12
- 8(7) Propodeal spines very short, wider than long (Fig. 45); promesonotum with small to median-sized, smooth and shining central area; México and Costa Rica
..... *A. brevispinosus*
- Propodeal spines as long as wide or longer than wider (Fig. 51); promesonotum with a large smooth and shining area 9
- 9(8) Dorsum of head, between vertex and central area, smooth and shining and densely foveolated; Costa Rica 10
- Dorsum of head never smooth and shining nor foveolate, instead reticulated or rugoreticulate 11
- 10(9) Eyes with 7–8 ommatidia; HW > 0.50 mm; dark brown in color *A. foveolatus*
- Eyes with one ommatidium; HW < 0.50 mm; light brown in color *A. minimus*
- 11(9) Most of side of pronotum smooth and shining (Fig. 51); hypostomal teeth large, stout (Fig. 53); eyes with 5 ommatidia; Costa Rica and Panamá *A. laevigatus*
- Sides of pronotum never with areas smooth and shining; hypostomal teeth never large or stout, eyes with two ommatida; Costa Rica *A. microps*
- 12(7) Mesosoma and gaster devoid of any kind of pilosity; body with bead-like carinae; postpetiole with a strong transverse carina; México *A. betoi* sp.n.
- Mesosoma and gaster always hairy; carinae of body not bead-like; postpetiole without strong transverse carina 13
- 13(12) Postpetiole posteriorly overhanging gaster (Figs 13, 18); in dorsal view, gaster distinctly emarginate at base, with humeral angles; Central America *A. silvestrii*
- Postpetiole posteriorly not overhanging gaster (as in Figs. 12, 24); in dorsal view gaster without humeral angles 14
- 14(13) Dorsum of mesosoma coarsely rugo-reticulate (Fig. 11) 15
- Dorsum of mesosoma with at least some central rugulae or costae more or less longitudinal (as in Figs. 23, 28), rarely with transverse striae (Fig. 39)..... 16
- 15(14) Propodeal spines pointed, higher than wide (Fig. 7); México to Colombia
..... *A. myops*
- Propodeal spines low, wider than high; México *A. mackayi* sp.n.
- 16(14) Lateral clypeal teeth very reduced, smaller than median clypeal teeth; HW 0.44 mm or less 17
- Lateral clypeal teeth larger than median clypeal teeth; HW > 0.44 mm 18
- 17(16) Eyes with six ommatidia; anterior margin of clypeal plate concave; HW > 0.42; Central Andes in Colombia *A. cristiani* sp.n.
- Eyes with four ommatidia; anterior margin of clypeal plate straight; HW < 0.42 mm; México to Costa Rica *A. longinoi* sp.n.
- 18(16) HW < 0.82 mm 19
- HW > 0.82 mm 21
- 19(18) Promesonotum in lateral view notably convex (Figs. 35, 37); dorsum of prome-

- sonotum with regular longitudinal striation 20
- Promesonotum in lateral view feebly convex (Fig. 33); typical mesosomal dorsum as in figure 23, but some as in figures 39, 40; probably a complex of species; México to Colombia..... *A. tristani*
- 20(19) Promesonotum strongly convex anteriorly (Fig. 37); propodeal spines low, broader than higher (Fig. 37); Brazil *A. striatus* sp.n.
- Promesonotum evenly convex (Fig. 35); propodeal spines triangular (Fig. 35); Gorgona Island in SW Colombia *A. costatus* sp.n.
- 21(18) HW > 0.90 mm; SW Colombia *A. grandis* sp.n.
- HW < 0.90 mm 22
- 22(21) Promesonotum with abundant erect hairs (each about 0.14 mm); body brown with appendages light brown; Eastern Andes in Colombia..... *A. vaderi* sp.n.
- Promesonotum with few to almost none erect hairs; head, mesosoma, petiole and postpetiole black with gaster and appendages dark brown; México *A. robustus* sp.n.

***Adelomyrmex betoi* Fernández NEW SPECIES (Fig. 72)**

Worker measurements. Holotype. HL 0.59 HW 0.49 SL 0.32 EL 0.025 WL 0.55 GL 0.72 TL 2.35 CI 83 SI 67.

Worker diagnosis. Mandibles with 5 teeth. Anterior margin of clypeal plate concave. Eyes small, with 4 ommatidia. Hypostomal tooth inconspicuous. Mesosoma evenly curved, metanotal groove shallow. Propodeal teeth triangular, the point upward. Petiolar node thick. Postpetiole posteriorly with a strong transverse carinae. Head rugoreticulated, the rugulae long, longitudinal, the sculpturation mixed with dense punctuation. Promesonotum irregularly rugolose at center, rugoreticulated in the periphery. All carinae or rugulae beade-like. Petiole and postpetiole laterally with irregular rugulae. Mesosoma and gaster devoid of any pilosity. Head, mesosoma, petiole, postpetiole dark brown, appendages and gaster brown.

Queen and male: Unknown.

Holotype worker: **MÉXICO: Veracruz**, Córdoba, Paraje Nuevo, Nacimiento, tropical evergreen forest, Ver. 176, 7.viii.1969, S. & J. Peck (Deposited in MZSP).

Paratypes: **MÉXICO:** 3 w, **Veracruz**, 4.4 mi N Huatusco, 4200', 2.viii.1973, A. Newton (MZSP). 13 w, **MÉXICO: Oaxaca**, 15 mi S Valle Nacional town, 400 feet, 21.V.1971, S. Peck leg. No. 204 (Deposited in MZSP, IAvH, ICN, LACM, MIZA, USNM, BMNH, PSW).

Comments. *A. betoi* is easily separated from the other members of the genus by the bead-like carinae or rugulae. That is, the carinae are not continuous, but look "plaited". The mesosoma and gaster are devoid of any pilosity, a trait unique in the genus. Moreover, the posterior face of the petiole has a strong transverse keel.

***Adelomyrmex biroi* Emery (Fig. 66, 76)**

Adelomyrmex biroi Emery, 1897:590 (w, q); Bolton, 1995:58
[Types not examined].

Worker measurements (n=2). HL 0.54 HW 0.50 SL 0.34 EL 0.03 WL 0.57 GL 0.65 TL 2.21 CI 92 SI 68.

Worker diagnosis: Head longer than broad, with feebly convex posterior and evenly rounded anterior corners. Mandibles with 4 teeth more or less of same size. Mandibles with distinct tooth in their basal margin, at or near midlength. Palp formula 1, 1 (Bolton, com. per.). Anterior margin of the clypeus without tooth. [Hypostomal tooth not observed]. Mesosoma slightly convex. Metanotal groove deep. Lateral sides of pronotum sharply angulated. Propodeal spiracle rounded, large, away from propodeal margin. Propodeum sloping with two stout short spines directed outward and backward, broadly separated between them. Propodeal lobe subtriangular. Petiole with node long. Head, thorax, petiole and postpetiole with numerous punctures, most separated by at least one puncture diameter; some small areas reticulo-punctated: between frontal carinae, in the center of promesonotal area, dorsal one third of propodeum; roughly sculptured on petiole. Several long and flexuous white hairs on body. Scape with several median suberect hairs, each scape with two long flexuous hairs. Body black, gaster dark brown, legs and antennae lighter.

Queen and male: Unknown.

Material examined: **PAPUA NEW GUINEA:** 2 workers, Wau N, on Bulolo Ridge, B-278, 650 m, 1974, S. Peck leg. (BMNH).

Comments. Readily separated from most others by sculpture (punctate throughout), teeth number on masticatory border, clypeal teeth absent, angulation of pronotal sides, petiolar shape, propodeal spiracle size, and pilosity on scape.

***A. boltoni* Fernández NEW SPECIES (Figs. 65, 74)**

Worker measurements. Holotype (Paratype). HL 0.60 (0.50) HW 0.52 (0.46) SL 0.41 (0.38) EL 0.05 (0.04) WL 0.70 (0.63) GL 0.75 (0.70) TL 2.60 (2.33) CI 88 (92) SI 74 (82).

Worker diagnosis. Head longer than broad, with convex posterior and evenly rounded corners. Sides of head slightly concave before the eyes, slightly convex past eyes. Mandibles with 4 teeth decreasing in size from the apical teeth, the antepenultimate (subbasal) smallest. Mandible internal side with two lamelliform setae near basal border, between basal teeth and teeth of basal border. Hypostomal teeth absent. Head, most of promesonotum, sides of pronotum and gaster smooth and shining; remainder of thorax with more or less longitudinal rugulae. Posterior face of propodeum long, smooth and shining. Petiole with rugulae concentric around node, dorsally transverse and longitudinal on sides; sides

of postpetiole with oblique rugulae, smooth and shining in the top, mandibles smooth and shining. Hairs long and flexuous on the body, shorter and appressed on antennae and legs. Body brown (including hairs), antennae and legs lighter.

Queen and male: Unknown.

Holotype worker: **PARAGUAY:** Tapua, Santa María, 25.x.82, F. Baud leg. (Deposited in BMNH).

Paratypes: 1 w, **BRAZIL:** Bahia, A. de Olivença, mata -W, 14°58'S 39°01'W, 23.iii.98, J.R.M. Dos Santos leg.; 1 w, Bahia, Aracatã A48, 15°15'90"S 39°16'01"W, J.R.M. Dos Santos leg.; 1 w, Bahia, Aritaguá, 14°39'S 39°04'W, 5.x.98, J.S. Carmo & J.R.M. Santos leg.; 1 w, Bahia, Buerarema, 14°45'30"S 39°13'00"W, 18.v.98, J.R.M. Dos Santos leg.; 1 w, Bahia, Camacá-Vargito, 15°24'S 39°31'W, 22.iii.99, J.R.M. Dos Santos leg.; 1 w, Bahia, Canavieiras-Oiticica, 14°24'34"S 39°01'00"W, 30.iii.98, J.R.S. Carmo leg.; 1 w, Bahia, Ibiripitanga, mata-W, 14°11'39"S 39°25'23"W, J.R.M. Dos Santos leg.; 3 w, Bahia, Ilheus, CEPLEC - G Winkler No. 331, 1.iv.1996, J.R.M. Santos; 4 w, Bahia, Ilheus, CEPLEC-G, Winkler 396, iv.96, A.C. Moreira leg.; 1 w, Bahia, Ilhéus-Itabuna, are zool. Km 22, x.86, J. Delabie leg.; 3 w, Bahia, Ilhéus, Japu, 3.iii.91, J. Delabie No. 4374 & 4401; 1 w, Bahia, Ilhéus-Pimenteira, mata W-A17, 14°32'S 39°25'W, 6.x.1997, J.R.M. Dos Santos & J.C.S. do Carmo leg.; 1 w, Bahia, Maraú-Faz, Agua Boa, mata, 1.vii.97, J.R.M. Dos Santos leg.; 1 w, Bahia, Maraú-Tremembé, mata W-A4, 7.vi.97, J.R.M. Dos Santos leg.; 1 w, Bahia, Monte Pascual, 16°52'03"S 39°55'03"W, 18.vii.97, J.R.M. Dos Santos leg.; 3 w, Bahia, Ilhéus, Una Reserve, 15°16'45"S 39°05'28"W, 21.xi.96, J.R.M. Santos leg.; 1 w, Bahia, Itacaré, 14°18'33"S 39°00'70"W, 25.vi.98, J.R.M. Dos Santos leg.; 1 w, Bahia, Ubaitaba, 14°15'01"S 39°19'27"W, 11.iv.97, J.C.S. Carmo leg.; 1 w, Bahia, Urucuca, 21.xii.93, R. Cordeiro No. 4572. 18 paratypes deposited in CEPLAC, 10 paratypes deposited in IAvH, ICN, LACM, MIZA, PSW, USNM, CWEM.

Comments. Very similar to *A. longinodus*. Separated by the sculpturing on the propodeal dorsum and the sides of the mesosoma. In *A. boltoni*, the lamelliform setae are reduced to 2, near the basal border and between the basal teeth (of the masticatory border) and the tooth of the basal margin. This species is known from Bahia (Brazil) and Tapua (Paraguay), which are widely-separated sites. The species will probably be found in other areas, when sampled with Winkler traps and Berlese funnels.

Adelomyrmex brevispinosus Fernández (Figs. 45–50)

Adelomyrmex brevispinosus Fernández, 2003:596 (w) in: Fernández & MacKay, 2003.

Worker diagnosis. Mandibles with 5 teeth, the three apical-most larger. Tooth of basal border very close to mandibular base. Anterior margin of clypeal plate slightly concave. Eye with about 17 ommatidia. Hypostomal tooth small. Promesonotum evenly convex and

clearly higher than propodeum. Metanotal groove well marked. Propodeal teeth short, subacute, wider than long. Head and promesonotum with longitudinal striation. Promesonotum with smooth and shining central spot, variable in size; if small the striae are concentric. Posterior face of propodeum with transverse carinae except in the middle, which is smooth and shining. Petiole and postpetiole with transverse oblique striation, continued posteriorly. Sides of pronotum with coarse, irregular striae. Short scattered hairs. Sides of mesosoma with long striae. Body dark, appendages dark brown.

Queen and male: unknown.

Comments. This species can be separated from the others in the genus by the short propodeal spines (wider than long) and by the smooth and shiny central area on the central part of the promesonotum. When this shiny area is large, the sculpture tends to form concentric circles around the area (Fig. 49). The anterior margin of the clypeus is straight to slightly convex. The color of this ant ranges from dark brown to black. *A. brevispinosus* is known from México and Costa Rica (for detailed distribution see Fernández & MacKay, 2003:598–599).

Adelomyrmex cristiani Fernández NEW SPECIES (Figs. 36, 75)

Worker measurements. Holotype. HL 0.50 HW 0.44 SL 0.23 EL 0.04 WL 0.39 GL 0.60 TL 1.87 CI 88 SI 52.

Worker diagnosis: Mandibles with 5 teeth decreasing in size from the apical teeth. Clypeal median seta short. Dorsum of clypeal plate with two curved ridges prolonged into frontal carinae. Lateral clypeal teeth very small. The last antennal flagellomere much broader than long, their length more or less as flagellomeres 2 to 10. Eyes small, with approximately 6 ommatidia. Hypostomal tooth very small, but visible. Mesosomal dorsum evenly arched, metanotal groove broad and shallow. Propodeum with sharp angulation instead of spines. Propodeal lobes slightly angulated. Petiole high in profile, more high than postpetiole, with anterior face evenly meeting the rounded dorsal face, then to inclined posterior face. Head and promesonotum longitudinally rugulose, rugulae on mesonotum more coarse; short dorsal propodeal face irregularly rugulated; propodeal declivity transversely rugulated between propodeal spines. Gaster smooth and shining with numerous dark punctures. Few long hairs on clypeus, frontal carinae and occipital borders; several suberect hairs on mesosomal dorsum, several long and flexuous hairs on petiole, postpetiole and gaster. Body light brown, legs and antennae paler.

Queen and worker: Unknown.

Holotype worker: **COLOMBIA:** Cordillera Occidental, transecto Tatamá, 1650m, 1983, Th. van der Hammen *et al.*, TAT 205. Deposited in ICN.

Comments. This is one of the smaller species of the genus. It can be recognized by short clypeal setae, small and poorly-faceted eyes, evenly curved mesosoma, broad propodeal angulation, petiole higher than postpetiole, and first gastric tergite with several dark

punctures. This species is named in honor of Dr. Cristián T. Samper K., general director of Instituto Humboldt from its creation in 1995 through 2001, for his friendship and strong support of insect surveys and collection in the Institute. Many of the goals in entomological research here have been set with the assistance and unfailing support of Cristián.

***Adelomyrmex costatus* Fernández NEW SPECIES (Figs. 35, 75)**

Worker measurements. Holotype. HL 0.63 HW 0.58 SL 0.36 EL 0.08 WL 0.55 GL 0.65 TL 2.36 CI 92 SI 62.

Worker diagnosis. Mandibles with 5 teeth, the basal and sub-basal distanced, the basal low and blunt. Eyes with about 12 ommatidia. Mesosoma continuous, metanotal groove poorly impressed. Hypostomal tooth low, blunt. Promesonotum highly convex. Propodeal sides triangular, acute. Propodeal spiracle small, circular. Petiole node thick, rounded above, postpetiole smaller, flat above. Head, mesosoma, petiole and postpetiole coarsely costate. Costulation in head and promesonotum longitudinal, with about 15 costae on promesonotum. About 6 transverse costae on propodeal dorsum. Longitudinal costulation on mesosomal sides, transverse on petiole and postpetiole sides. Gaster smooth and shining. Dense long hairs on dorsum body. Body dark brown, appendages lighter.

Holotype worker: **COLOMBIA: Cauca**, PNN Isla Gorgona, Alto El Mirador, 380 m., 31.iii.00, R. Duque leg. (Deposited in IAvH).

Comments. *A. costatus* has a continuous mesosoma, the promesonotum is conspicuously and evenly convex, the petiolar node is thick, and there is coarse longitudinal costulation. This combination of characters is unique in the genus.

***Adelomyrmex foveolatus* Fernández (Fig. 62)**

Adelomyrmex foveolatus Fernández, 2003:599 (w) in Fernández & MacKay, 2003.

Worker diagnosis. Mandibles with 5 teeth, the apical larger than the subapical. The angle between basal tooth of masticatory border and tooth of basal border well developed. Anterior margin of clypeal plate slightly concave. Eye with 8 ommatidia. Hypostomal tooth small. Mesosoma evenly convex interrupted only by the deep metanotal groove. Propodeal spines about as long as wide. Petiole rounded above. Head smooth and shining with widely spaced foveae, medial area with about 9 longitudinal rugulae. Most of promesonotum smooth and shining. Posterior face of propodeum with several transverse carinae. Most of petiole and postpetiole smooth and shining. Dorsal pilosity moderately long, dense. Body reddish-brown.

Queen: Similar to worker but with the typical queen myrmicine traits. The anterior ocelli more deep impressed into the tegument than others. Propodeal sides and mesopleura

with longitudinal striation. Mesonotum/metanotum smooth and shining with slight striation. Propodeal teeth stout.

Male: Unknown.

Comments. The foveae on the head are notable and scattered, which distinguishes this species from the others in the genus. These foveae are mixed with longitudinal strigulations in the central part of the head. This species is found in the lower forest of Costa Rica. Distribution provided in Fernández & MacKay 2003:599–600.

***Adelomyrmex grandis* Fernández NEW SPECIES (Figs. 34, 75)**

Worker measurements. Holotype (Paratype). HL 1.0 (0.98) HW 0.96 (0.90) SL 0.67 (0.63) EL 0.13 (0.11) WL 1.0 (0.94) GL 1.3 (1.23) TL 4.2 (3.90) CI 96 (90) SI 70 (72).

Worker diagnosis. Mandibles with 6 teeth decreasing in size from the apical teeth. Last flagellomeres more or less gradually decreasing in size, so there is not a conspicuous club of two segments. Eyes relatively big, with more than 30 facets. Hypostomal tooth very small. Promesonotum convex, metanotal groove distinct. Propodeum sloping with two short spines directed upward, outward and backward. Petiole high, campaniform with anterior side sloping and posterior side slightly concave. Postpetiole with posterior face concave. Dorsum of head and promesonotum longitudinally striated/rugulose. Propodeal dorsum irregularly rugulose, with longitudinal trend. Propodeal declivity smooth and shining interrupted with more or less curved transverse rugulae between propodeal spines. Sides of petiole and postpetiole irregularly rugulose. Anterior face of petiole smooth and shining. Posterior surface of petiole with strong transverse striation. Hairs yellowish, long and flexuous on the body, more short and appressed on antennae and legs. Body brown to dark brown. Some long rugulae on mandibles. Tip of clypeal plate, clypeal teeth and mandible teeth black.

Queen and male: Unknown.

Holotype worker: COLOMBIA, Nariño, Barbacoas, vereda Berlín, El Diviso, 520m, 22.viii.94, F. Escobar leg. No.294. Deposited in ICN.

Paratypes: 2 w, same data as holotype, deposited in IAvH, MCZ.

Comments: This is the largest species known for the genus. Besides size, *A. grandis* can be separated from congeners by mesosomal shape and petiole height (Fig. 34). *A. grandis* resembles *A. myops*, but can be distinguished by body size and mesosomal dorsal sculpture.

***Adelomyrmex hirsutus* Mann (Fig. 67, 76)**

Adelomyrmex (Arctomyrmex) hirsutus Mann, 1921:458 (w).

Adelomyrmex hirsutus: Bolton, 1995:58.
[Holotype worker examined, USNM].

Worker measurements (n=1). HL 0.61 HW 0.50 SL 0.35 EL 0.06 WL 0.58 GL 0.72 TL 2.36 CI 82 SI 70.

Worker diagnosis. The last antennal flagellomere large, nearly as long as the remainder of antennal funiculus. Eyes reduced to dark spots. Metanotal groove slightly impressed. Propodeal spiracle round and small. Dorsal surface of propodeum shorter than declivitous face, with two very short and triangular spines. Propodeal lobe subtriangular, slightly pointed. Protibiae swollen near apex. Head, mesosoma, petiole and postpetiole smooth and shining, punctured, punctures more or less closed. Longitudinal midline of head without punctures. Most of declivitous face of propodeum smooth and shining with median keel joining the propodeal spines; most of lateral sides of thorax smooth and shining with spaced punctures; meso and metapleuron longitudinally rugose; petiolar sculpture similar to head. Body light brown, legs yellowish brown; abundant median whitish pilosity on head dorsum, scapes, thorax dorsum, petiole, postpetiole and gaster. Appressed pilosity on funiculus. Shorter and reclined pilosity on legs.

Material examined: **FIJI**, holotype worker, W.M. Mann (USNM).

Comments. *A. hirsutus* can be separated from *A. samoanus* by eye condition (they are reduced to dark spots); mesosoma outline, as seen in side view; and head sculpturing (punctate in *hirsutus*, punctate striate in *samoanus*).

***Adelomyrmex laevigatus* MacKay (Figs. 38, 51–56)**

Adelomyrmex laevigatus MacKay, 2003:600 (w) in: Fernández & MacKay, 2003.

Worker diagnosis: Posterior border of head nearly straight. Mandibles with 5 teeth, the three apical-most larger. Anterior margin of clypeal plate concave (Fig. 54). Eye with about 5 to 12 ommatidia. Hypostomal tooth large, stout (Fig. 53). Promesonotum evenly convex and higher than propodeum (Fig. 51). Metanotal groove well marked. Propodeal dorsum short. Propodeal teeth longer than wide. In dorsal view, anterior margin of first tergum clearly concave. Head with rugae and foveae confluent. Dorsum of promesonotum largely smooth and shining, with trace of longitudinal rugulae on the sides (Fig. 56). Most of side of pronotum smooth and shining. Propodeum with transverse rugae. Dorsum of petiole and postpetiole smooth and shining, laterally with some oblique rugae. Pilosity on dorsum of body moderately long, scattered. Body dark brown, antennomeres lighter.

Queen and male: Unknown.

Comments. *Adelomyrmex laevigatus* can be separated from the other species in the genus as the promesonotum is nearly completely smooth and shiny, with only a few rugulae on the sides. No other species of *Adelomyrmex* possesses this characteristic, except *A. micans*, in which the entire head is also smooth and glossy. Additionally, the sculpture of the head is distinctive, with a mixture of rugae and foveae. The first tergite is notably concave when viewed from above. The hypostomal teeth are large, robust, much more than

any other species in the genus (Fig. 53). The numbers of ommatidia ranges from 5–6 up to 12. The species is known from Costa Rica and Panamá. Fernández & MacKay (2003:600–601) offered distribution records.

***Adelomyrmex longinodus* Fernández & Brandão NEW SPECIES (Figs. 57–61, 64, 74)**

Worker measurements (Paratypes= 4). HL 0.55–0.57 HW 0.50–0.52 SL 0.36–0.37 EL 0.04–0.05 WL 0.63–0.67 GL 0.50–0.55 TL 2.30–2.44 CI 90–91 SI 71–72.

Worker diagnosis: Head with convex posterior and evenly rounded corners. Hypostomal bridge strong and evenly developed; very much distinct from head venter. Hypostomal teeth absent. Sides of head slightly concave before the eyes, slightly convex past eyes. Mandibles with 4 teeth decreasing in size from the apical teeth, the antepenultimate (subbasal) smallest. Mandibles with tooth in their basal margin, not followed by a notch. Palp formula 1,2. Maxillary palpomere subcylindrical and the labial palps geniculate; the apical segment much enlarged and globose. Eyes lenses absent, although the pigments are clearly visible under the reflective light, but not under the SEM picture. Clypeus short, elevated in the middle as a narrow stripe, pointed and fused with frontal carinae. Anterior margin of the clypeus without teeth, although with feebly projections instead. Dorsal view of thorax as in Fig. 60. From above, the promesonotum is heart shaped, ending in a triangular mesonotum. Pronotal humeri very broadly rounded in dorsal view, the dorsal alitrunk pinched in at the metanotal line. Propodeum spiracle relatively large, its orifice circular and situated just above the midlength of the sclerite; propodeum dorsum straight, meeting declivity in sharp diverging teeth, gently curved inwards when seen from above; declivity smooth, the metapleural lobes not joined over the foramen. Opening of the metapleural gland indistinct (Fig. 61). Petiole with a short anterior peduncle, lacking an anteroventral process; petiolar node subquadrate, dorsally broadly convex in profile until it approaches the postpetiole where it ends abruptly in a right angle. Postpetiole low and small, gently convex in profile, in dorsal view very broadly attached to the gaster (Fig. 61). In profile the postpetiole articulated medially on the first gastral segment. Sting large and strongly sclerotized, disproportionately powerful. Head, most of promesonotum, sides of pronotum and gaster smooth and shining; propodeal triangle and sides of petiole and postpetiole with coarse rugae more or less longitudinal on petiole and postpetiole. Posterior face of propodeum deep, smooth and shining. Petiole with rugulae concentric around node, dorsally transverse and longitudinal on sides; sides of postpetiole with oblique rugulae, smooth and shining in the top, mandibles smooth and shining. Abundant fine hairs long and flexuous on body, shorter and appressed on antennae and legs. Body dark brown (including hairs), antennae and legs lighter.

Queen measurements. Paratype. HL 0.54 HW 0.51 SL 0.22 WL 0.66.

Larger, but not very much, than conspecific worker. Compound eyes with several facets over the largest diameter. Otherwise description as worker.

Male: Unknown.

Holotype worker: **BRAZIL: Amazonas**, near Manaus, 1.iii.94, R. Didham leg. (deposited in BMNH).

Paratypes: 7 paratype w, same data as holotype, deposited in BMNH, MCZ, MZSP, ICN, PSW. 1 paratype q and 6 paratype w, **BRAZIL: Amazonas**, Manaus, Shift 52, Floresta Berlese funnel No. 04, 03.iii.98, M: García et al. leg., deposited as follow: 1 worker in INPA, 3 workers (2 coated with gold) and dealated queen in MZSP, 1 worker in IAvH, 1 worker in SMNK. 1 worker, **BRAZIL: Amazonas**, Manaus, Rs 3114 20, i.1994 A.B. Casimiro (Deposited in CEPLAC). 1 worker, **BRAZIL: Espiritu Santo**, Linhares, 7.vii.1994, A.B. Casimiro No. 4869 (Deposited in CEPLAC).

Comments. This very interesting species is similar to *A. boltoni*. Both have several morphological traits that differ from other known *Adelomyrmex* species. At first glance, these could be sufficient to merit generic status, and both species were separated from other *Adelomyrmex* species in BMNH.

The MZSP specimens (Brazil: Manaus) were collected from soil samples in a locality whose ant fauna is otherwise well-known. No other specimen of this rather distinctive species has ever been collected by traditional techniques. Subterranean ants may be far more common than previously imagined, perhaps with a heretofore-unsuspected fauna awaiting description.

A. longinodus can be separated from *A. boltoni* by lack of sculpturing on the sides of the thorax (longitudinal rugulae in *boltoni*).

Adelomyrmex longinoi Fernández NEW SPECIES

Worker measurements. Holotype (Paratype). HL 0.49 (0.50) HW 0.40 (0.41) SL 0.26 (0.28) EL 0.025 (0.030) WL 0.42 (0.44) GL 0.56 (0.56) TL 1.72 (1.76) CI 83 (83) SI 64 (69).

Worker diagnosis. Mandibles with 6 teeth, the three apical larger. Anterior margin of clypeal plate concave. Lateral clypeal teeth very reduced, smaller than median clypeal teeth. Eyes small, with 4 ommatidia. Hypostomal tooth small, inconspicuous. Promesonotum continuous, slightly convex and slightly higher than propodeum. Propodeal teeth triangular. Petiolar node narrow rounded above. Postpetiole with transverse carinae in their posterior face. Head rugoreticulated. Promesonotum irregularly rugose. Sides of pronotum, petiole and postpetiole rugoreticulated. Sides of mesosoma irregularly rugulose. Body red brown, appendages lighter.

Queen measurements. Paratype. HW 0.60 HL 0.71 SL 0.44 EL 0.13 WL 0.75 GL 0.84 TL 2.90 CI 84 SI 73.

As worker, with the typical queen myrmicine traits. Promesonotum smooth and shining to sculptured. Sides of pronotum with oblique rugulae. Pilosity short, erect, moderately abundant.

Holotype worker: **COSTA RICA**: **Heredia**, Est. Biol. La Selva, 10°26'N 84°01'W, 50–150m, 18.vi.1999, INBio-OET No. CRI002 720661 (Deposited in INBio).

Paratypes: **MÉXICO**: 2 w, **Chiapas**, Ruinas de Palenque, 4.ix.1974, E.M. & J.L. Fisher (LACM); **COSTA RICA**: 5 w, **Heredia**, Est. Biol. La Selva, 10°26'N 84°01'w, 50–150m, vi.1999, INBio-OET; 1 w, **Heredia**, 13 km SSW Puerto Viejo, 10°21'N 84°03'w, 300m, 17.vii.1986, J. Longino No. 1390-S; 1 w, **Heredia**, 5 km SW Puerto Viejo, 10°25'N 84°02'w, 100m, 15–21.vii.1986, J. Longino No. 1392-S; 1 w, **Guana- caste**, Cerro Cacao, 10°56'N 85°27'W, 1500m, 9–11.ii.1989, J. Longino No. 2339-S; 3 w, **Puntarenas**, 19 km S Ciudad Neily, 8°29'N 82°58'W, 20m, 25.iii.1990, J. Longino 2658-S; 1 w, **Puntarenas**, Res. Biol. Carara, 9°47'N 84°36'W, 30 m, 25–26.vii.1985, J. Longino No. 534-s. Five paratypes deposited in INBio and 9 paratypes deposited in LACM, ICN, MZSP, MIZA, BMNH.

Comments. The Mexican workers differ slightly from the Costa Rican ones. The head sculpturing is rugulate to rugo-reticulate posteriorly. The apical and subapical teeth on the masticatory margin are bigger than the basal and sub-basal teeth, and the promesonotum of the queen is smooth and shining (sculptured in Costa Rican queen). However, I consider these differences to be geographical variation, not worthy of species status. New collections in the areas between Mexico and Costa Rica (including queens and males) may clarify whether or not we are dealing with more than one species.

Adelomyrmex mackayi Fernández NEW SPECIES

Worker measurements. Holotype. HL 0.69 HW 0.59 SL 0.43 EL 0.06 WL 0.66 GL 0.84 TL 2.78 CI 86 SI 73.

Worker diagnosis: Mandibles with 5 teeth decreasing in size from apical teeth. Clypeal carinae not prolonged into frontal carinae. Eyes small, with approximately 5–6 ommatidia. Hypostomal tooth small, sharp pointed. Promesonotum evenly convex. Metanotal groove deep, distinct. Propodeal spines short, notably wider than higher. Head, pronotum and mesonotum coarsely reticulate-rugose. Transverse rugae between propodeal spines. Petiole and postpetiole smooth and shining with a few carinae in the sides. Mandibles smooth with longitudinal rugae feebly marked on outer half. Mandibles, legs and gaster smooth and shining. Hairs yellowish, long and flexuous on the body, more short and appressed on antennae and legs. Body brown, antennae, legs and gaster brown-yellowish.

Queen and male: Unknown.

Holotype worker: **MEXICO**: **Chiapas**, 2.1 km NW Pueblo Nuevo, Solistahuacán, Yerbabuena preserve, 2070 m, 23.ix.1992, R.S. Anderson No. 92-114 (Deposited in MCZ).

Comments. This species is close to *A. myops*. However, the propodeal spines are very short. Known only from type locality.

***Adelomyrmex micans* Fernández**

Adelomyrmex micans Fernández, 2003:601 (w) in Fernández & MacKay, 2003.

Worker diagnosis. Head slightly concave posteriorly. Mandibles with 7 teeth, the three apical-most larger. Anterior margin of clypeal plate straight. Clypeal plate dorsally with longitudinal carinae which extends to the level of the antennal insertions. Eyes with about 8 ommatidia. Some workers with 3 ocelli. Hypostomal tooth very small. Promesonotum slightly convex. Metanotal groove well marked. Propodeum angulate, without teeth. Genae with several longitudinal rugulae. Three longitudinal rugulae extending from frontal lobes. Propodeal dorsum with 4 transverse striae, posterior face smooth and shining with 4 longitudinal striae. Dorsum of body with numerous long hairs. Propodeum with short scattered hairs. Body dark brown, appendages lighter.

Queen: As worker with the typical traits of myrmicine queens. Hypostomal teeth not easily visible.

Male: Unknown.

Comments. This species is easily recognizable, as the head is smooth and shiny as no other species of the genus in Mesoamerica. Much of the remainder of the body is also smooth and glossy, except for a few small areas with sculpture. The propodeum has angulate corners instead of teeth or spines. It is notable that some of the workers have well defined ocelli, a characteristic which is not found in the other species in the genus and a phenomenon which is rare in the Myrmicinae. These specimens are obviously workers and are not intercastes. The hypostomal tooth is small, and difficult to see, and may even be absent. Species known only from México (see Fernández & MacKay, 2003:602 for records).

***Adelomyrmex microps* Fernández (Fig. 63)**

Adelomyrmex microps Fernández, 2003:602 (w) in Fernández & MacKay, 2003

Worker diagnosis. Mandibles with 6 teeth, the three apical-most larger. Anterior margin of clypeal plate strongly concave. Eyes reduced to about 2 ommatidia. Hypostomal tooth small. Promesonotum evenly convex and higher than propodeum. Metanotal groove wide, shallow. Propodeal spines long, much longer than wide. Petiole rounded above. Postpetiole with narrow concavity posteriorly. First tergum anteriorly concave in dorsal view. Head with dense rugo-foveolate sculpture. Most of promesonotum smooth and shining, with longitudinal striae on periphery. Sides of mesosoma with irregular striae. Pilosity dorsal on body long, dense. Body reddish-brown.

Queen and male: Unknown.

Comments. This species can be separated by the small eyes, which are reduced to a

pair of ommatidia, the metanotal suture is wide and shallow, and the propodeal spines are long. It is only known from the type locality in Costa Rica (Estación La Selva, Heredia, Fernández & MacKay, 2003).

Adelomyrmex minimus Fernández

Adelomyrmex minimus Fernández, 2003:603 (w) in Fernández & MacKay, 2003.

Worker diagnosis. Mandibles with 5 teeth, decreasing in size from the apical. The angle between basal tooth of masticatory border and tooth of basal border well developed. Anterior margin of clypeal plate slightly concave. Eyes with 1 ommatidium. Hypostomal tooth medium sized, stout. Mesosoma evenly convex, interrupted only by the deep metanotal groove. Propodeal spines about as long as wide. Petiole rounded above. Postpetiole with median carinae on posterior side. Head smooth and shining with dense and large foveae in posterior part, sides rugo-foveolated, medial area with about 7 longitudinal rugulae. Promesonotum smooth and shining. Sides of mesosoma smooth and shining with some irregular striae. Posterior face of propodeum with several transverse carinae. Most of petiole and postpetiole smooth and shining. Dorsal pilosity moderately long, dense. Body light brown.

Queen and male: Unknown.

Comments. Very similar to *A. foveolatus*, but distinguished by: smaller size, eyes reduced to one ommatidium; foveae more dense, hypostomal teeth larger, mesosomal sides with some rugulae and color lighter. Known from the holotype worker (Puntarenas, Costa Rica) from the stomach of *Dendrobates granuliferus* frog (Fernández & MacKay, 2003).

Adelomyrmex myops (Wheeler) (Figs. 7–12, 31, 71)

Apsychomyrmex myops Wheeler, 1910:261 (w). Emery, 1922:268; Mann, 1922:33, Menozzi 1931:269; Smith, 1947:470 (Redescription and key). [Holotype seen, USNM].

Adelomyrmex myops (Wheeler): Kempf, 1972:18 (New combination); Bolton 1995:58.

Worker measurements. Holotype (other, n=9). HL 0.75 (0.57–0.70) HW 0.66 (0.53–0.66) SL 0.46 (0.38–0.41) EL 0.07 (0.05–0.07) WL 0.76 (0.56–0.70) GL 0.87 (0.68–0.87) TL 3.00 (2.31–3.00) CI 88 (90–100) SI 70 (66–73).

Worker diagnosis: Mandibles with 5 to 7 teeth decreasing in size from apical teeth. Eyes small, with approximately 10–12 ommatidia. Hypostomal tooth small, sharp pointed. Promesonotum evenly convex, dorsal face of propodeum very short. Metanotal groove deep, distinct. Propodeal spines higher than wide. Node with anterior and posterior

faces more or less parallel, dorsal face nearly straight. Postpetiole lower than petiole, subquadrate, ventral carina well developed. Head, pronotum and mesonotum coarsely reticulate-rugose, with longitudinal rugulae at anterior part of head and more or less on the sides of mesosoma. Transverse rugae between propodeal spines and sides of petiole and postpetiole. Declivous face of propodeum ranges from smooth to covered with transverse rugae. Mandibles smooth or with longitudinal rugae feebly marked on outer half. Mandibles, legs and gaster usually smooth and shining. Hairs yellowish, long and flexuous on the body, more short and appressed on antennae and legs. Body black to dark brown, antennae and legs lighter, brown to yellowish.

Queen measurements: HW 0.65 HL 0.75 SL 0.44 EL 0.14 WL 0.83 GL 0.96 TL 3.12 CI 87 SI 68.

As worker with the typical modifications of myrmicine queen. Central anterior portion of promesonotum smooth and shining, posterior area with longitudinal rugulae. Metanotum coarsely rugo-reticulate. Pronotum rugo-reticulate. Sides of mesosoma with striation more or less longitudinal, most of katapisternum smooth and shining.

Male: Unknown.

Material examined: **MÉXICO:** 1 w, **Chiapas**, 2.1 km NW Pueblo Nuevo, Solistahuacán, Yerbabuena Preserve, 2070 m, 23.ix.1992 R.S. Anderson No. 92-114 (LACM); 4 w, **Chiapas** 10 km S Palenque, 30.iv.88, W. P. MacKay leg. No. 81058-2 (WEMC); 6 w, **Puebla**, Tezintlán Poc, 18.iv.48, F. Bonnet leg. No. 1350 (USNM); 1 w, **Tamaulipas**, "S.A. de Guatemala", Rancho del Cielo, 1070m, 4.vii.69, tall cloud forest, litter, S. & J. Peck (IAvH); **GUATEMALA:** 1 w, holotype, Livingston 10.87, Schwartz & Barber coll., Type No. 13198 (USNM), "*Apsychomyrmex myops*" (USNM); 1 w, Los Amates, Kellermann (LACM); 12 w, Mixco, W.M. Mann leg. (USNM); **HONDURAS:** 5 w, Lombardia, W.M. Mann leg. (USNM); 3 w, Pueblo San Juan (USNM); 2 w., 1 q., Pueblo San Juan, W.M. Mann (LACM); **COSTA RICA:** 2 w, **Heredia**, Estación Biológica La Selva, 10°26'N 84°10'W, 50–150m, iii.1993, INBio-OET (INBio); 2 w, **Heredia**, 17 km S Puerto Viejo, 10°18'N 84°02'W, 600m, 20–26.i.1989, J. Longino No. 2230-S (INBio); 4 w, **Puntarenas**, 19 km S Ciudad Neily, 8°29'N 82°58'W, 20m, 26.iii.1990, J. Longino No. 2658-S (INBio, ICN); 6 w, **Puntarenas**, Corcovado National Park, 8°29'N 83°36'W, < 100m, 17.xii.1990, J. Longino No. 2768-S (INBio); 2 w, **Puntarenas**, Osa, Rancho Quemado, 8°42'N 83°33'W, 2–300m, 15.xii.1990, J. Longino No. 2760-S (INBio); 1 w, **Puntarenas**, P.N. Manuel Antonio, 9°23'N 84°09'W, 40m, 27–28.vii.1985, J. Longino No. 633-S (INBio); 3 w, **San José**, H. Schmidt, B12 (MZSP); 2 w, Turrialba, 10.ii.31 (MZSP); 1 w, San Lorencito, 1990, P. Hammond leg., (BMNH); 26 w, Santa Clara, Colombiana Farm, 1.iii.24, W.M. Mann leg. (USNM); 1 w, without specific locality, F. Nevermann leg. (MZSP); **PANAMÁ:** 1 w, Barro Colorado Island, Canal Zone, 1.i.60, W.L. Brown Jr. & E.C. McCluskey leg. 7-56 (MZSP); 3 w, Barro Colorado Island, x.41, J. Zetek No. 4879, Lot No. 41-20624 (MZSP); **COLOMBIA:** 1 w, **Antioquia**, Frontino, Orquídeas National Park, Venados Cabin, 900 m., 6.vi.96, E.E. Palacio leg. (ICN); 1 w, **Bolívar**, Zambrano,

Hacienda Monterrey, 50 m., 22.x.94, A. Molano leg. (ICN); 1 w, **Chocó**, Riosucio, Atrato River, La Gira, L.F. Mendoza leg. No. 045 (IAvH).

Comments. This species is variable in size, number of mandibular teeth, color and some minor aspects of morphology. In addition to the variation mentioned in Smith (1947:471), the propodeal declivity varies from smooth and shining to transversely rugose, with the number of rugae varying among specimens.

The worker from the Colombian Atlantic coast (Bolívar State) has 5 mandibular teeth, and the first gastral segment is opaque and densely shagreened. I assigned this specimen to *A. myops* in light of the variability typical of several species of the genus.

In a Mexican worker (IAvH) the mandibular configuration differs conspicuously from the other workers in the species. There are two teeth in the basal margin, or the space between basal teeth of masticatory border and basal teeth was secondarily reduced. I await more material to take any taxonomic action.

A worker from Guatemala (Los Amates, LACM) is bigger (HW 0.71, HL 0.80, WL 0.79) and differs from the typical *A. myops*. The body sculpturing is coarser and more marked. The promesonotum forms a bulging convexity, notably higher than the propodeum, more than is typical for *A. myops*. As in the Colombian or Mexican workers, I await more material before taking any action. Guatemala, Nicaragua and Salvador are very poorly sampled for ants (and other insects) and several populations and species may be the key to resolving some taxonomic problems in *A. myops*.

***Adelomyrmex robustus* Fernández NEW SPECIES (Figs. 4–6, 25–30, 72)**

Worker measurements. Holotype (Paratypes, n=10). HL 0.98 (0.93–0.96) HW 0.88 (0.83–0.88) SL 0.61 (0.59–0.64) EL 0.09 (0.10–0.13) WL 0.93 (0.91–0.95) GL 1.08 (1.09–1.13) TL 3.76 (3.59–3.70) CI 90 (89–90) SI 70 (71–73).

Worker diagnosis. Head wider posteriorly. Mandibles with 5 stout teeth, the 3 apical bigger. Clypeal teeth and tooth of basal margin stout, size about medial masticatory teeth. Eyes moderate, with about 20 ommatidia. Hypostomal tooth very small. Promesonotum evenly convex. Propodeum armed with two spines small, pointed. Node of petiole thick, rounded above. Mandibles dorsally with strong longitudinal rugulations. Head frons longitudinally with rugulate, several rugulae irregular, meshed with notable piliferous punctures. Promesonotal dorsum with longitudinal coarse rugulae in the center, the rugulae more irregular in the periphery and with notable foveae. Petiole and postpetiole transversely rugulated. Legs and gaster smooth and shining. Hairs on the promesonotum very long, about 0.25 mm. Body black, appendages dark brown, tarsi yellowish.

Queen measurements: HL 0.98 HW 0.91 SL 0.63 EL 0.16 WL 1.03 GL 1.29 TL 4.09 CI 93 SI 69.

As worker, with the modifications typical of myrmicine queens.

Male: Unknown.

Holotype worker: **MEXICO: Chiapas**, 8 mi N Pueblo Nuevo, Solistahuacán, 6000 feet, 26–27.viii.1973, leaf litter forestry floor, A. Newton leg. No. 12a (Deposited in MZSP).

Paratype workers: **MEXICO**: 36 w, 9 q, **Chiapas**, 2.1 km NW Pueblo Nuevo, Solistahuacán, Yerbabuena Preserve, 2100 m, in liquid amber forest litter, 23.ix.1992, R.S. Andersen No. 92-114; 20 w, **Chiapas**, 8 mi Pueblo Nuevo, Solistahuacán, 26.viii.1973; 3 w, 1 q, **Chiapas**, Tapalapa, 12 km N Capilla, 13.iii.1994, R. Jones HR 4; 3 w, **Chiapas**, 5 km E Rayón, 1700 m, 23.xii.1991, P.S. Ward No. 11581-8 (PSW). Twenty six paratypes deposited in LACM, 17 paratypes deposited in MZSP, 22 paratypes deposited in CEPLAC, INBio, IAvH, ICN, JTL, IEXM, IMLA, MCZ, MIZA, BMNH, USNM, CWEM.

Comments. This species can be differentiated from most *Adelomyrmex* by its size (HW equal or greater than 0.83 mm), tooth of the basal margin robust, as big or bigger than the third tooth of the masticatory margin, sculpturing formed by irregular rugulae mixed with conspicuous piliferous punctures. The propodeal spines are low and triangular.

There is uniformity in size and other characteristics in the samples examined, all from Chiapas, Mexico. The workers of this species might be confused with large workers of *A. tristani*, although there are differences, as pointed out in the previous discussion of this species.

The queens can be differentiated, in addition to the characters already mentioned for the worker, by a single small, inconspicuous ocelli. The striation of the promesonotum is almost complete, with the smooth and shiny area small. The petiole seems to have a ventral anterior swelling.

***Adelomyrmex samoanus* Wilson & Taylor (Figs. 68, 76)**

Adelomyrmex (Arctomyrmex) samoanus Wilson & Taylor, 1967:77 (w).

Adelomyrmex samoanus: Bolton, 1995:58.

[Paratypes examined, LACM].

Worker measurements (Paratype). HL 0.51 HW 0.41 SL 0.29 EL 0.04 WL 0.50 GL 0.59 TL 1.94 CI 80 SI 71.

Worker diagnosis. Mandibles with 5 teeth, the basal distanced from sub-basal. Hypostomal tooth very small. Eyes poorly impressed with about 4 ommatidia, ill defined. Promesonotum slightly convex. Metanotal groove broad, well impressed. Propodeal dorsum short, flat, then sloping in the declivity face. Propodeal spines triangular. Propodeal lobes rounded. Petiole subtriangular, peduncle very short. Postpetiole ventrally with two transverse carinae. U-shaped trench of first tergum deep. Dorsum of head with longitudinal rugulae. Promesonotum smooth, feebly shining, with a few irregular feeble rugulae. Metanotal groove with short rugulae. Declivity face of propodeum smooth with two

medial transverse carinae. Sides of mesosoma with few irregular rugulae. Sides of petiole with transverse rugulae. Pilosity recostated on head, erect and scattered on promesonotum, petiole and gaster. Body brown, appendages lighter.

Queen and male: Unknown.

Material examined. SAMOA: 3 paratype w, West Samoa, Poutasi S., Upola, in leaf mould, rain forest, 2.ii.1956, T.E. Woodward leg. (LACM, ICN).

Comments. *A. samoanus* can be separated from other species by the sculpturing of the body (head sub-opaque with longitudinal rugulae, smooth pronotum with few and weak rugulae), mesosomal configuration, and the pilosity (reclining on the head, erect on the rest of the body). This species is known solely from Western Samoa.

Adelomyrmex silvestrii (Menozzi) (Figs. 13–18, 32, 73)

Apsychomyrmex silvestrii Menozzi, 1931, 270 (w); Borgmeier, 1937:210; Smith, 1947:409.

[Holotype not seen, presumably in Deutsches Entomologisches Institut].

Adelomyrmex silvestrii (Menozzi): Kempf, 1972:18 (New combination); Bolton, 1995:58.

Worker measurements (n=8). HL 0.56–0.57 HW 0.52 – 0.54 SL 0.36–0.38 EL 0.05 – 0.06 WL 0.50–0.55 GL 0.74–0.77 TL 2.30–2.35 CI 94 SI 71–72.

Worker diagnosis: Sides of head evenly convex. Mandibles with 5 teeth decreasing in size from the apical teeth. Basal margin of the mandible with the tooth feebly developed. Dorsum of clypeal plate with two curved ridges very closed, prolonged into frontal carinae. Eyes small, with less than 10 facets, most with 5–6 facets. Hypostomal tooth small but clearly visible in frontal oblique view. Promesonotum slightly convex to flat, with strong transversal fringe on anterior pronotal margin. Metanotal groove weak. Propodeum sloping with two spines long, stout, directed backwards and nearly horizontal. Petiole stout in profile, with feebly concave posterior side, ventral face convex with several transverse rugae, appearing as serrations in profile. Postpetiole high, campaniform with a ventral transverse ridge toothlike as seen in profile. In dorsal view and lateral view, postpetiole extending posteriorly over basal gaster, as a blunt point. Gaster with emarginate base and humeral angles. Dorsal surface of head, pronotum and mesonotum with coarse, longitudinal rugulae. Transverse rugae between propodeal spines and sides of petiole and postpetiole. Declivity face of propodeum from smooth to covered with transverse rugae. Mandibles, clypeal plate, legs, petiole, postpetiole and gaster shining. Meso and hind tibia with some long hairs. Hairs yellowish, long and sparse (most hairs about 0.125 mm long, as long as basal width of apical flagelomere), more short and appressed on antennae and legs. Body black to dark brown or dark reddish, antennae and legs more lighter, brown to yellowish.

Queen: Not measured.

Male: Unknown.

Material examined: **MEXICO**: 3 w, **Chiapas**, 12.5 km NW Ocosingo, 1400 m, 16.ix.1992, R.S. Anderson No. 92-106 (INBio, IAvH); 2 w., **Veracruz**, Fortin Canyon, Meziac River, 5.viii.69, S. & J. Peck (BMNH); 1 w, **Veracruz**, Pueblo Nuevo, near Tetzonapa, 17.viii.53, E.O. Wilson No. 13F (MZSP); 1 q, **Puebla**, Tezintlán, Pue, 18.iv.46, F. Bonnet No. 1350 (USNM); 1 w, **San Luis de Potosí**, El Sarto, S. Peck No. 11 (MZSP); **BELIZE**: 3 w, Toledo, 11.iii.95, Lyal & Mullis (BMNH); 2 w, Millionario, 9.iii.95, Lyal & Mullis (BMNH); 1 w, Las Cuevas, 12.viii.95, J. Beard (BMNH); 1 w., Maya Mountains, 7.ix.97, C. Lyal (BMNH); **GUATEMALA**: 1 w., in orchid from Guatemala, shake out, 9.xi.45, R.W. Pratts, (port San Francisco) No. 19943 (USNM); **COSTA RICA**: 1 w, **Alajuela**, 14 km S Volcán Arenal, 10°20'N 84°43'W, 1000 m, 29.iv.1988, J. Longino No. 2037-s (INBio); 13 w, **Alajuela**, Rio Peñas Blancas, 10°19'N 84°43'W, 800 m, 26-28.iv.1987, J. Longino No. 11579-s (INBio); 1 w, **Cartago**, 4 km E Turrialba, 9°54'N 83°39'W, 550 m, J. Longino No. 1644-s (INBio); 1 w, **Heredia**, Don Arturo, Santo Domingo de Heredia, 21.viii.1990, I. Perfecto No. 105 (LACM); 4 w, **Heredia**, 17 km S Puerto Viejo, 10°18'N 84°02'W, 550 m, 12.ix.1985, J. Longino No. 1088-s (INBio); 2 w, **Heredia**, Est. Biol. La Selva, 10°26'N 84°01'W, 50-150 m, v.1983, OET (INBio); 1 w, **Heredia**, Est. Biol. La Selva, 10°26'N 84°01'W, 50-150 m, 4.ii.1974, Talbot & VanDevender (LACM); 1 w, **Heredia**, 18 km N Volcán Barba, 10°17'N 84°05'W, 800 m, 4.vii.1986, J. Longino No. 1383-s (INBio); 1 w, **Guanacaste**, 8 km S Santa Cecilia, 10°59'N 85°26'W, 650 m, J. Longino No. 2529-s (INBio); 1 w., **Guanacaste**, Rincón de la Vieja, 20.x.96, F. Fernández leg., (ICN); 2 w, **Limón**, Res. Biol. Hitoy-Cerere, 9°40'N 83°02'W, 200 m, 29.viii.1985, J. Longino No. 942-s (INBio); 2 w, **Puntarenas**, Monteverde, 10°18'N 84°48'W, 1500 m, 16.iv.1988, J. Longino No. 1998-s (INBio); 3 w, 19 km S Ciudad Neily, 8°29'N 82°58'W, 20 m, 26.iii.1990, J. Longino No. 2658-s (INBio); 3 w, **Puntarenas**, Par. Nac. Corcovado, 8°29'N 83°36'W, 100 m, 17.xii.1990, J. Longino No. 12768-s (INBio); 3 w, **Puntarenas**, Res. Biol. Carara, 9°47'N 84°36'W, 500 m, 25-26.vii.1985, J. Longino No. 606-s (INBio); 1 q., province unknown, Costa Rica, intercepted in orchid in Honolulu, 28.ix.56 (USNM).

Comments. Distinguished from other species of the genus by the shape of postpetiole and anterior emargination of the gaster.

***Adelomyrmex striatus* Fernández NEW SPECIES (Figs. 37, 74)**

Worker measurements (Paratype). HL 0.58 HW 0.51 SL 0.38 EL 0.08 WL 0.53 GL 0.66 TL 2.13 CI 88 SI 75.

Worker diagnosis: Mandibles with slightly oblique masticatory borders, with 5 teeth decreasing in size from the apical teeth, the last two poorly defined. Clypeus short. Dorsum of clypeal plate with two curved ridges prolonged into frontal carinae. Clypeal tooth of the anterior clypeal margin not readily visible in full face view. Eyes small, with approximately 14 facets. [Hypostomal tooth not observed]. Promesonotum strongly convex; met-

anotal groove feebly impressed. Propodeum sloping with two very short spines, reduced to small triangles. Propodeal lobe subtriangular, evenly rounded. Petiole and postpetiole stout, massive. Node of petiole subquadrate, with anterior and posterior faces slightly sloping to apex which is slightly convex. Venter of postpetiole with two transverse ridges, the anterior one more developed, in profile looking as teethlike projections; dorsal surface as in petiolar node. Head, pronotum and mesonotum longitudinally striate. Sides of mesosoma and petiole longitudinally striate. Dorsal face of propodeum, petiole and postpetiole transversely striate. Postpetiole obliquely striate. Anterior side of petiole and posterior side of postpetiole transversely striate. Mandibles smooth to with longitudinal rugae feebly marked in the outer half. Mandibles, legs and gaster smooth and shining. Hairs yellowish, long and flexuous on the body, some very long, more short and appressed on antennae and legs. Few long hairs on hind femora. Head and thorax brown, gaster light brown, antennae and legs yellowish.

Material examined: 1 w, paratype, **BRASIL: Amazonas**, Igarapé, Marianil, R. Branco, Rov. Km 25 NE Manaus, 22.viii.62, W.L. Brown Jr. leg. M-13 (MZSP). Holotype worker, same locality, seen but not measured. Both deposited in MZSP. In the MZSP there are also a teneral worker of this species.

Comments. I have followed the name and designation of type material as labeled by the late W. W. Kempf, who discovered this new species, even though I didn't find the manuscript notes of *A. striatus* in the archives of MZSP. This species is readily separated from congeners by the conspicuous longitudinal striation, very short propodeal spines, and subquadrate petiole and postpetiole.

***Adelomyrmex tristani* (Menozzi) (Figs. 19–24, 33, 39–40, 73)**

Apsychomyrmex tristani Menozzi, 1931:260 (w); Borgmeier, 1937:240 (w); M.R. Smith, 1947:472 (worker redescription). [Holotype not seen, presumably in Deutsches Entomologisches Institut].

Adelomyrmex tristani: Kempf, 1972:18 (New combination); Bolton, 1995:58 (w.).

Worker measurements (n=40). HL 0.53 – 0.73 HW 0.45 – 0.65 SL 0.29 – 0.41 EL 0.05 – 0.08 WL 0.53 – 0.73 GL 0.63 – 0.92 TL 2.00 – 2.84 CI 90 – 91 SI 55 – 63.

Worker diagnosis: Head with posterior margin weakly flat to feebly concave. Mandibles with 5 to 6 teeth decreasing in size from the apical teeth. Tooth of basal margin of mandible not protuberant, smaller than subapical masticatory tooth. Eyes small, with 7 to 22 facets. Hypostomal tooth small but visible. Promesonotum slightly convex, higher than propodeal dorsum; metanotal groove well marked. Lateral sides of pronotum angulated. Propodeal spiracle rounded. Propodeum sloping, with the spines variable in size and shape, from low, triangular to long and narrow. Petiole high, with anterior side sloping and posterior side more or less feebly convex; sometimes petiole nearly quadrate, with anterior

and posterior faces nearly parallel. Postpetiole campaniform with a ventral transverse ridge toothlike as seen in profile. Sting well developed. Mandibles dorsally with moderate longitudinal rugulations. Clypeal plate smooth and shining. Head frons longitudinally rugulate, head sides irregularly rugulated and mixed with punctures. Promesonotal dorsum variously sculptured, from longitudinal fine rugulae to longitudinal to strong coarse costae, in some workers the rugae or striae mixed, anteriorly oblique to transverse, in a few workers only a very few central longitudinal rugae visible. Promesonotal rugae or striae mixed with punctures. Propodeal declivity transversely rugulated between propodeal spines. Declivitous face of propodeum from smooth to covered with transverse rugae. Petiole and postpetiole normally transversely rugulated, sometimes times dorsally smooth and shining. Legs and gaster smooth and shining.

Hairs yellowish, long and flexuous on the body, more short and appressed on antennae and legs. Body black, dark brown or brown, legs light brown, tarsi yellowish.

Queen measurements: HL 0.75 HW 0.66 SL 0.45 EL 0.11 WL 0.84 GL 1.05 TL 3.22 CI 88 SI 68.

As worker with the following differences: Mandibles with all teeth of masticatory border of similar size. Three ocelli present. 12 – 13 ommatidia in the largest diameter of eye. Pronotum laterally costulated. Promesonotum longitudinally costulated with areas smooth and shining variable, from anterior half to nearly all promesonotum. Metanotum longitudinally costulated. Mesopleurae with longitudinal costulation and areas smooth and shining. Propodeum costulated longitudinally in the sides, transversely in the declivitous face.

Male: Unknown.

Material examined: **MEXICO:** 3 w, **Chiapas**, 17.3 km NW Bochi, 1800 m., 24.ix.1992, R.S. Anderson No. 92-115 (INBio); 6 w, 10 q, **Chiapas**, 7.4 km SSW Motozintla de Mendoza, 2000 m., 21.ix.1992, R.S. Anderson No. 92-110 (INBio, IAvH); 2 w, **Chiapas**, km N Unión Juárez, Volcán Tacana, lower slopes, 2000 m, 19.ix.1992, R.S. Anderson No. 92-110 (INBio); 9 w, **Puebla**, Teztlán, 18.iv.46, F. Bonnet No. 1350 (LACM, USNM); 6 w, **Veracruz**, Fortin Canyon, Metlac River, 5.viii.69, S. & J. Peck (BMNH); **GUATEMALA:** 1 w, San Francisco, 19.iii.46 No. 20342, in *Odontoglossum* sp. Lot. No. 46-3094 (MZSP); **COSTA RICA:** 2 w, **Alajuela**, 6.5 km E Monteverde, 10°18'N 84°45'W, 950 m., 22.viii.1985, J. Longino No. 861-s (INBio); 3 w, 1 q, **Alajuela**, 3 km E Monteverde, 10°18'N 84°47'W, 1400 m., 26.iv.1990, J. Longino No. 2674-s (INBio); 2 w, **Guanacaste**, Cerro Cacao, 10°56'N 85°27'W, 1500 m., 9-11.ii.1989, J. Longino No. 2339-s (INBio); 13 w, **Heredia**, 18 km N Volcán Barba, 10°17'N 84°05'W, 800 m, 14.vii.1986, J. Longino No. 1383-S (INBio); 1 w, **Heredia**, La Selva Biological Station, 10°26'N 84°01'W, 50-150 m, x.1992, OET (INBio); 14 w, 1 f., **Puntarenas**, Monteverde, 10°18'N 84°48'W, 1560 m, 15.vii.1984, L. Longino (LACM); 24 w, 7 q, **Puntarenas**, Monteverde, 10°18'N 84°48'W, 1300-1800 m, 15.vii.1984 – 14.v.1991, J. Longino Nos. 1572 – 2888-s (INBio, IAvH); 15 w, **Puntarenas**, Monteverde, 10°18'N 84°48'W, 1400 m., iv.-v.1987, S. Little (INBio, IAvH); 14 w, 5 q, **Puntarenas**, Monteverde, 10°18'N

84°48'W, 1550 m, 8.iv.1988 – 10.xii.1987, J. Longino No. 1994-s to 1973-s (INBio); 6 w, 1 q, **Puntarenas**, Monteverde, 10°18'N 84°48'W, 1600 m., 30.iv.1989, L. Longino No. 2486-s (INBio); 3 w, 1 f, **Puntarenas**, Monteverde, 10°18'N 84°48'W, 1600 m., 1.v.1991, U. California EAP (INBio); 1 w, **Puntarenas**, Estación Pittier, 9°02'N 82°55'W, 1670 m., 2.vii.1989 (INBio); 2 w, **Puntarenas**, Fila Cruces, 8°47'N 83°03'W, 1200 m., 29.vi.1995, J. Longino No. 3693-s (INBio); 3 w, **San José**, Laredo, en *Philodendron*, tunnel, 8.v.57, (USNM); 1 w, "From México or Costa Rica, in orchid, intercepted in Brownsville, Texas, 1 w, (ICN). **COLOMBIA**: 2 w, **Antioquia**, El Retiro, Fca. El Barcino, 2100 m, 11°51'N 83°95'W, winkler trap, 13.xii.1993, A. Vahos leg. (ICN); 1 w, **Quindío**, Filandia, 1870 m, 1.vi.2002, J. Sossa leg. (IAvH); 11 w, **Santander**, Encino, Cachalú Natural Reserve, 06°04'N 73°07'W, 2000 m, winkler trap, 20.iii.1999, E.L. Gonzalez leg. (IAvH, ICN); 4 w, **Valle**, Alto Anchicaya, Farallones de Cali National Park, 650 m, winkler trap, S. Sarria leg. (IAvH, ICN); 1 w, **Valle**, Cali, El Ensueño, 27 km road Cali-Buenaventura, 1780 m, in litt., 8.xii.1993, P. Chacón leg. (ICN).

Comments. This species is highly variable in size, color, pilosity, configuration of the propodeal spines, and to a lesser extent, petiole configuration. Relative to other groups of monomorphic myrmicines, there is a great deal of size variation, with worker HW ranging from 0.45 to 0.65 mm. The eyes vary from 7–8 to 20–22 ommatidia, with this number correlated with size. In color, the majority of the specimens are black with brown appendages and yellowish extremities. The normal pilosity is moderately long, although very long in some small brown workers (Costa Rica, Barbas Volcano, 800 m). The petiole typically has a short peduncle, curving continuously into the dorsal rounded face; in some workers, the petiole is somewhat more square, with the anterior and posterior faces almost parallel. The characteristics with the greatest variability are the sculpturing of the promesonotum and the size and form of the propodeal spines. The most typical tendency in worker sculpturing is the formation of rugulae or longitudinal carinae, either moderately or strongly marked, which form 14–15 coarse costulae over the dorsal area. Most of the time these costae or rugulae do not touch the anterior border of the pronotum, instead being replaced by oblique or transverse rugae. In a few cases these rugae reach the anterior margin of the pronotum, and in some workers they are concentric around a few central longitudinal rugae. In a few other workers, they are mostly oblique, almost transverse. Figures 23, 39 and 40 show some examples of the sculpturing. The teeth or propodeal spines are variable as well, from low and triangular (shorter than their bases), to elongated and slender in shape.

With such wide variation it would be easy to interpret the endpoints (in isolation) as different species, and in fact at the beginning of this revision some of the extreme examples seemed to represent new species, based especially on the size and sculpturing of the promesonotum. Nevertheless, critical examination of wider samples, from México to Colombia, reveals a continuum of size, sculpturing, and color mixtures. There are samples from the same locality and even the same nest in which the workers are different in size

and promesonotum sculpturing. Under these circumstances, it is a challenge to identify characteristics by which species can be unambiguously separated. It is possible that *A. tristani* is actually a complex of closely-related species that have very recently undergone (or are undergoing) speciation. Populations in valleys or isolated mountains might be in the process of becoming discontinuous from neighboring populations, with accompanying differences in size, color, pilosity, or habits. Males associated with workers (lacking to date) could provide important information for evaluating these alternatives. Bigger samples, males, and genetic study should elucidate whether *A. tristani* is an extremely variable species or a set of closely-related species.

Some of the biggest specimens of *A. tristani* look like *A. robustus*. Nevertheless, the latter has a typical HW equal or greater than 0.83 mm, and most are around 0.85 mm. The rugulae of the head and promesonotum in *A. robustus* are more irregular, never straight, with more abundant and marked piliferous punctures. The tooth of the basal margin is large and robust, as big as or bigger than the subapical tooth of the masticatory margin; the clypeal teeth are also conspicuous. The propodeal spines are always low and black. *A. robustus* is known only from Mexico.

Adelomyrmex vaderi Fernández NEW SPECIES (Figs. 41–44, 75)

Worker measurements. Holotype (Paratypes, n=13). HL 0.97 (0.90–0.93) HW 0.89 (0.85–0.89) SL 0.61 (0.54–0.61) EL 0.09 (0.08–0.09) WL 0.96 (0.90–0.97) GL 1.13 (1.06–1.15) TL 3.99 (3.64–3.88) CI 90 (91–98) SI 69 (60–68).

Worker diagnosis. Mandibles with 6 teeth decreasing in size from the apical teeth. Eyes with 22 to 30 facets. Hypostomal tooth broad, low, with rounded apex. Promesonotum convex, metanotal groove distinct. Propodeum sloping with two short spines directed upward, outward and backward. Petiole high, campaniform with anterior side sloping and posterior side more or less convex. Postpetiole high, campaniform, and with posterior face concave. Head and promesonotum coarsely reticulate-rugulose with longitudinal trend in head dorsum and central area of promesonotum dorsum. Propodeal dorsum irregularly rugulated. Space between propodeal spines with curved transverse rugulae. Hairs blackish to dark brown. Body black, sides of mesosoma and petiole dark brown. Gaster, legs and antennae light brown.

Queen measurements. HL 0.98–0.99 HW 0.92–0.94 SL 0.56–0.59 EL 0.19–0.20 WL 1.11–1.13 GL 1.23–1.24 TL 4.24–4.26 CI 92–94 SI 60–64.

Differing from workers in the normal myrmicine queen traits (Fig. 42). Three ocelli present, the anterior in fossae. Eyes with more than 120 facets. Wings as in Fig. 43, large (front wing 3.85 mm long). Wings densely and finely hairy.

Male measurements. HL 0.57 HW (including eyes) 0.65 SL 0.52 EL 0.25 WL 0.95 GL 1.1 TL 3.31 CI 114 SI 80.

Male (undescribed, Figs. 43–44). With the general traits of myrmicine male. Head

hemispheric with prominent and globose eyes. Mandibles simple, pointed. Palpal formula (*in situ*) 2,2. Clypeus medially protuberant, convex. Frontal carinae covering covering only partially antennal receptacles. Eyes with numerous facets (>30 in maximum diameter line). Three prominent spherical ocelli. Scape less curved than in workers, surpassing conspicuously vertexal border. Antennae 13-segmented, flagellomeres increasing in size from scape to apex, without evident club. Propodeal spiracle posterad and laterad. Propodeum without spines. Wings densely hairy, but less than in females. Petiole subcampaniform, with the node evenly meeting in a rounded summit, postpetiole dome-shaped, devoid of ventral transverse carinae. Promesonotum, major areas of sides of thorax and gaster smooth and shining, promesonotum with several punctures. Head, mesonotum, propodeum lateral and dorsal, petiole and postpetiole irregularly rugulated, in anterior head border with transverse trend, as well as propodeal, petiolar and postpetiolar dorsum. Body heavily hairy. Head, mesosomal dorsum, petiole, postpetiole and gaster with conspicuous suberect long hairs, those of petiole and postpetiole more dense and reclined. Antennae heavily covered with short decumbent hairs. In full face view, several long hairs produced outward and forward from clypeal area. Mandibles with long curved hairs produced outward and forward. Numerous short, erect hairs on eyes.

Holotype worker: **COLOMBIA, Cundinamarca**, Medina, Gazaunta river, Cristalina creek, 1750m, 8.iii.1997, F. Escobar leg., deposited in IAvH.

Paratypes: 9 workers, same data as Holotype, deposited in ICN, MCZ, BMNH, MIZA, MZSP, PSW, USNM and CWEM; 3 workers, **COLOMBIA: Cundinamarca**, Medina, Farallones de Medina, 1800m, 1.vi.96, G. Fagua leg., deposited in IAvH, ICN. 3 Paratype queens, same data as holotype worker. Deposited in IAVH and MZC. 2 paratype males, same data as Holotype, deposited in IAvH.

Comments. *A. vaderi* is one of the largest species in the genus. It can be separated from other species (especially from the closely-related *A. myops*) by body size, eye size, mesosomal sculpture and postpetiole shape, and from *A. grandis* by mesosomal profile, sculpture, and size.

This is the first description of a queen for Neotropical species, and the first world description of a male. The dark aspect of these ants evokes Darth Vader, the malign character in the *Star Wars* series, for whom this species is named.

***Baracidris* Bolton (Figs. 69, 70, 77)**

Baracidris Bolton, 1981:252 (w). Type species: *Baracidris meketra* Bolton (by original designation). Bolton, 1995:22.

The genus *Baracidris* includes three small species (one undescribed) which are litter inhabitants in Central and Western Africa. Although the genus is easily isolated from the other African myrmicines, this is a more difficult task regarding the World fauna. The

combination of characters (median portion of the clypeus as narrow fringe, antennae 12 segmented with club 2 segmented, reduced palps, metapleural lobes larger than in *Adeomyrmex*, petiole and postpetiole subcylindric) separates this genus from all other myrmicines, although currently we lack synapomorphic features for *Baracidris*. We maintain this genus primarily upon its geographical distribution.

Key to species (workers). Modified from Bolton, 1981:255

- 1 Body without standing pilosity and with appressed pubescence; mesosoma dorsally with punctures; HW less than 0.46 mm 2
- Body with standing pilosity on head, petiole and postpetiole, less on mesosoma, without appressed pubescence; promesonotum dorsally with a large central area smooth and shining, devoid of punctures; HW > 0.46 mm (Kenya, Uganda)
..... *B. pilosa* sp.n.
- 2(1) Central portion of anterior clypeal margin not produced into a narrow truncated lobe; vertexal margin in full face view indented or concave medially (Ivory Coast, Ghana, Nigeria) *B. meketra* Bolton
- Central portion of anterior clypeal margin produced into a narrow truncated lobe; vertexal margin in full face view not indented or concave medially (Gabon)
..... *B. sitra* Bolton

Baracidris meketra Bolton (Fig. 77)

Baracidris meketra Bolton, 1981:255 (w). Bolton, 1995:80.

This species can be recognized by the absence of standing hairs, posterior head margin concave medially and clypeus not produced into a narrow truncated lobe. Known from Nigeria, Ghana and Ivory Coast.

Baracidris pilosa Fernández NEW SPECIES (Figs. 69, 77)

Worker measurements. Holotype (Paratype). HL 0.52 (0.54) HW 0.46 (0.47) SL 0.37 (0.38) PW 0.32 (0.33) WL 0.59 (0.60) CI 88 (87) SI 80 (81) TL 2.14 (2.39).

Holotype worker: UGANDA: Mt Elgon, Kapwata, 2250m, 30.v.93, Cuccodoro & Eme Not. 16a (Deposited in BMNH).

Paratype: KENYA: Embu Irangi Forest Station, 2000m, 11.x.77, V. Mannest, J.L. Perret (Deposited in IAvH, but destroyed in the mail).

Worker diagnosis. Monomorphic. Mandibles with five teeth decreasing in size from

apical to basal the apical and subapical larger, third teeth intermediate in size, the remaining small. Mandibles shining sculptured with longitudinal rugulae. Apical flagellum of the antennae considerably bigger than others, so there is not a strong club of 2 segments. Median portion of clypeus sharply raised in the form of a narrow longitudinal ridge, its anterior margin projecting feebly past clypeus. Frontal lobes small and very close, separated by narrow strip, smooth and shining. Eye minute with a single ocellus of diameter of slightly more than 0.010 mm. Vertexal margin of head very slightly concave medially. Promesonotum forming a long convexity in profile. Metanotal groove well impressed, breaking clearly the profile of the mesosoma. Propodeum short, sloping posteriorly to the short but broad triangular teeth. Metapleural lobe big, broadly rounded, connected with propodeal teeth by a lamella. Four to five transverse carinae on the declivitous posterior face of the propodeum. Petiole in profile with the peduncle shorter than the node. Node of petiole and postpetiole dorsally convex. In dorsal view the petiole slightly wider than longer, the anterior peduncle a little broader than long and shorter than node; the node wider than peduncle. Postpetiole in dorsal view slightly broader than long, their sides slightly convex. Postpetiole in profile with the sternite produced into a truncated ventral process. Dorsum and sides of head with small and close packed foveolate punctures, the spaces between smooth and shining. A central longitudinal narrow area of head devoid of punctures. Dorsum of mesosoma with similar punctures, but scattered along lateral margins, most of the central area smooth and shining. Sides of pronotum with a few scattered marginal punctures, most of the area smooth and shining. Otherwise sides of mesosoma with more or less oblique longitudinal rugulae. Dorsum and sides of petiole and postpetiole with scattered punctures, some of petiole mixed with rugulae. Head, petiole and postpetiole with dense long reclinated hair, mesosoma with less hairs. Body devoid of appressed pubescence. Body dark brown, appendages light brown, hairs whitish.

This new species of *Baracidris* has some interesting taxonomic and biogeographic implications. The clypeal configuration brings this species close to the basic plan of *Adelomyrmex*, in which the raising anteriorly of the clypeus as a narrow bidentate plate is distinctive. In some species this band is even more reduced.

***Baracidris sitra* Bolton (Fig. 77)**

Baracidris sitra Bolton, 1981:256 (w). Bolton, 1995:80.

Recognized by clypeus produced into a narrow truncated lobe, posterior margin of head not concave medially and body devoid of conspicuous hairs. Known from Gabon.

BIOGEOGRAPHICAL CONSIDERATIONS

The two genera of the *Adelomyrmex* genus-group exhibit in the Southern Hemisphere a vicariant distribution pattern with *Baracidris* confined to the Afrotropical part of the African continent, and with *Adelomyrmex* being represented in New Guinea, the Western Pacific archipelagoes of Samoa and Fiji, and in the Neotropical Region (tropical South America and Middle America). Large gaps in range are a prominent feature of the distribution pattern.

Such vicariance suggests a group that originated in the Southern Hemisphere on the Gondwanian land mass before Africa became isolated in Lower Cretaceous time (some 135 to 125 MYA) (Storey, 1995; MacLoughlin, 2001). So, the ancestral stock of the extant genera of the group could have originated no later than that time, with initial differentiation of ancestral *Baracidris* and ancestral *Adelomyrmex* coinciding with separation of the West Gondwanian African continent from its principal counterpart, South America. Such timing predates the age of the earliest known ant fossils, indicating that the Formicidae is probably older than postulated previously.

The geographical range of ancestral *Adelomyrmex* probably extended in later Cretaceous time from South America through East Gondwanaland (i.e., Antarctica + Australia + New Zealand). Probably events associated with climatic change (glaciation of Antarctica and drying of large parts of the Australian continent) were the driving forces in causing the present wide separation of elements of *Adelomyrmex*, whose extant members seem to be adapted to tropical climate, and life in mesic habitats.

If, through unfavorable climatic changes, *Adelomyrmex* experienced forced withdrawal from large parts of East Gondwanaland, in West Gondwanian South America, the opposite occurred, with range expansion into tropical Middle America, and extensive differentiation there (the *A. tristani* species complex has there many populations isolated in valleys, from Panamá to México).

In conclusion, the geographical distribution of *Adelomyrmex* genus-group is an interesting biogeographic puzzle, the broad outlines of which have been addressed above. This subject will be addressed in more detail, in the prospective treatment of phylogenetic and chorological relationships of the group taxa.

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APPENDIX NO. 1

Listed below are the names of genera and species studied, other than *Adelomyrmex* genus group.

Ponerinae— *Pachycondyla* spp.

Ecitoninae— *Eciton burchelli* (Westwood)

Cerapachyinae— *Acantostichus* sp.

Myrmicinae:

Attini— *Atta cephalotes* (Linnaeus)

Basicerotini— *Octostruma balzani* (Emery)

Blepharidattini— *Blepharidatta* new species

Cephalotini— *Cephalotes atratus* (Linnaeus)

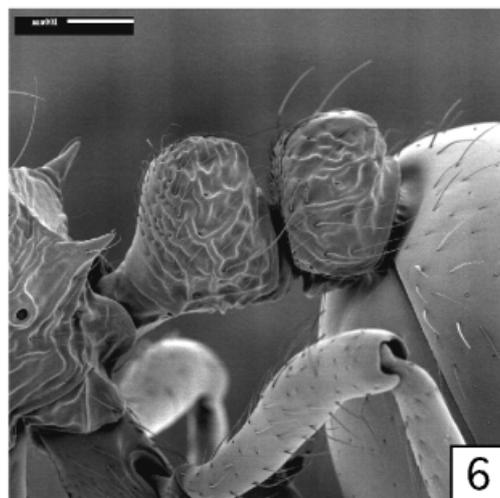
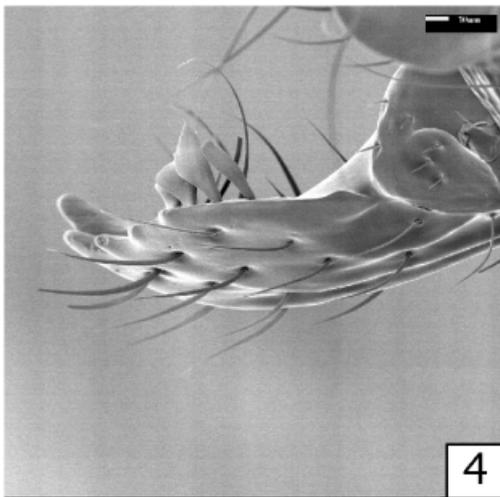
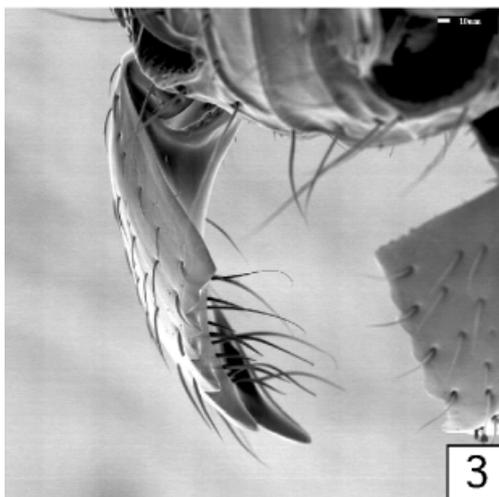
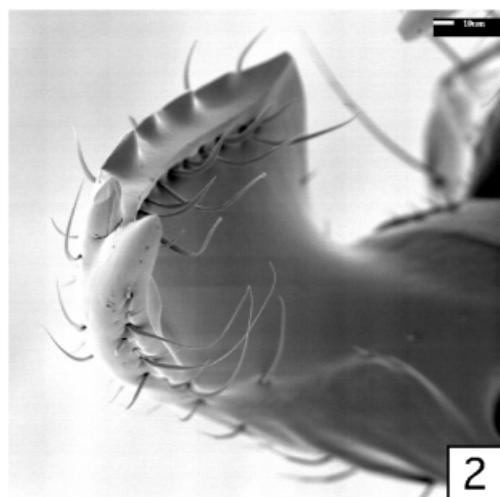
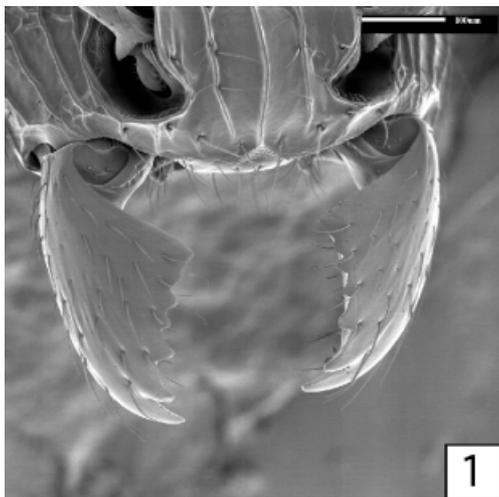
- Crematogastrini— *Crematogaster* spp.
 Dacetini— *Daceton armigerum* (Latreille)
 Formicoxenini— *Leptothorax* sp.
 Myrmecini— *Perissomyrmex snyderi* M.R.Smith
 Myrmicini— *Myrmica* spp., *Hylomyrma* spp., *Pogonomyrmex mayri* Forel
 Ochetomyrmecini— *Ochetomyrmex semipolitus* Mayr, *Tranopelta gilva* Mayr
 Pheidolini— *Pheidole* spp.
 Pheidologetonini— *Carebara* spp., *Oligomyrmex urichi* (Wheeler)
 Solenopsidini— *Megalomyrmex leoninus* Forel, *Solenopsis* spp.
 Stenammini— *Stenamma felixi* Mann
 Tetramoriini— *Tetramorium* spp..
 Dolichoderinae— *Dolichoderus* spp.
 Formicinae— *Camponotus* spp., *Paratrechina* spp.

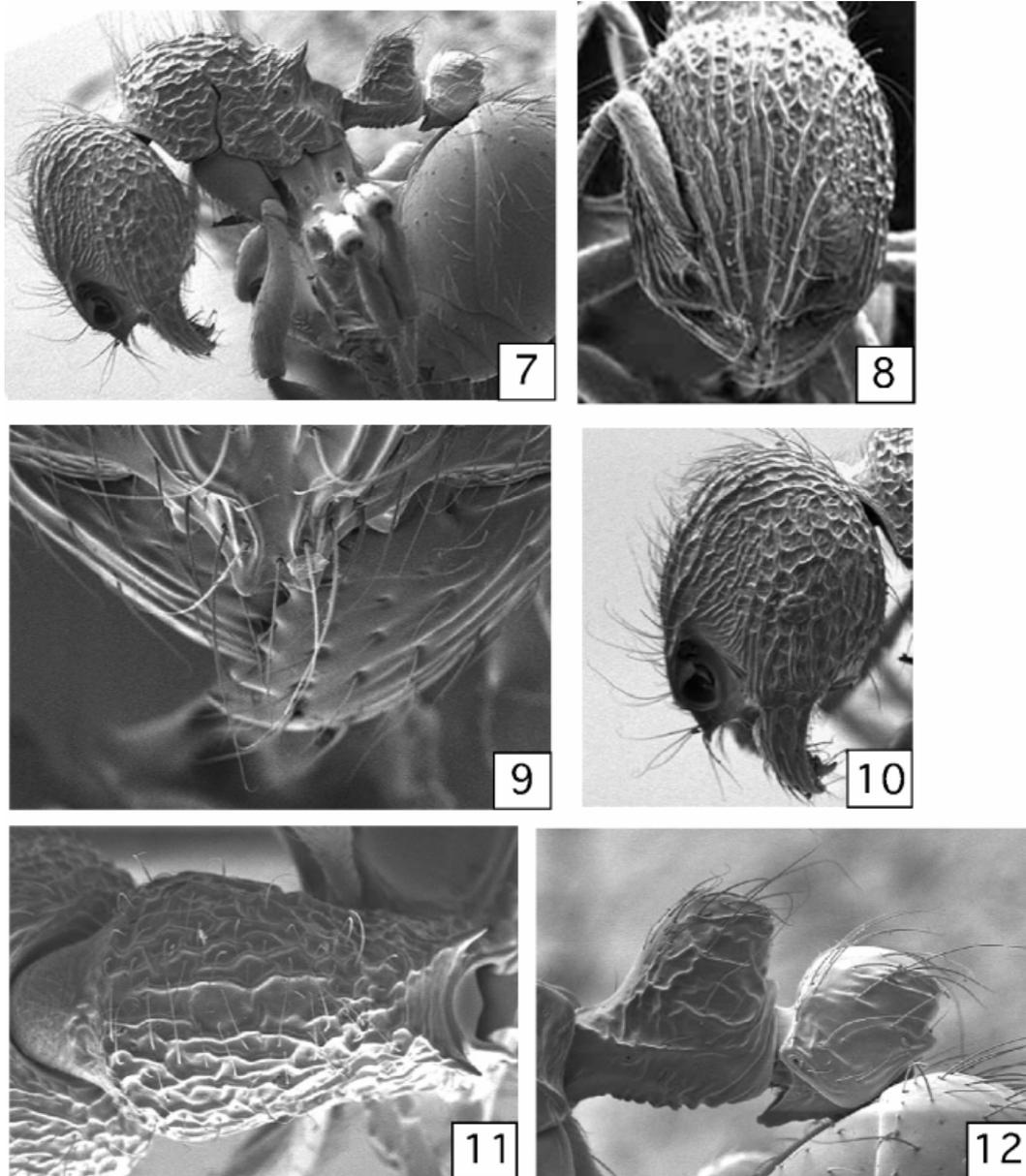
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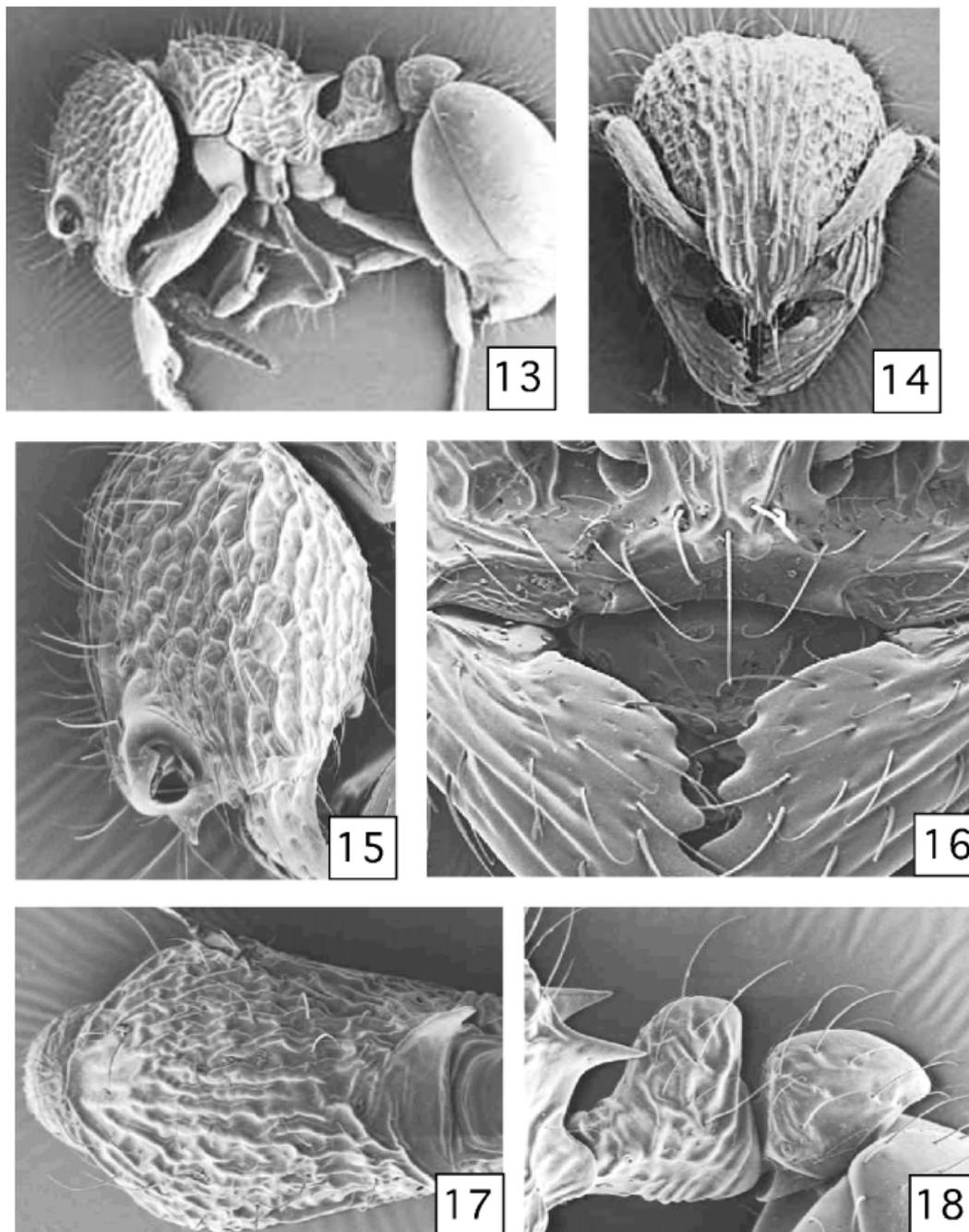
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FIGURES 1–6. Figs. 1–3: *Myrmica* sp. (worker, England) Fig. 1 Frontal view, clypeus and mandibles; Fig. 2 ventral lateral view of mandibles showing normal setae; Fig. 3 dorsal oblique view of mandibles showing normal setae. Figs. 4–6: *Adelomyrmex robustus* (workers): Fig. 4. Dorsal oblique view of mandibles showing modified setae; Fig. 5 Right mandible in ventral view Fig. 6 Lateral view of petiole, postpetiole and basal portion of first tergum.

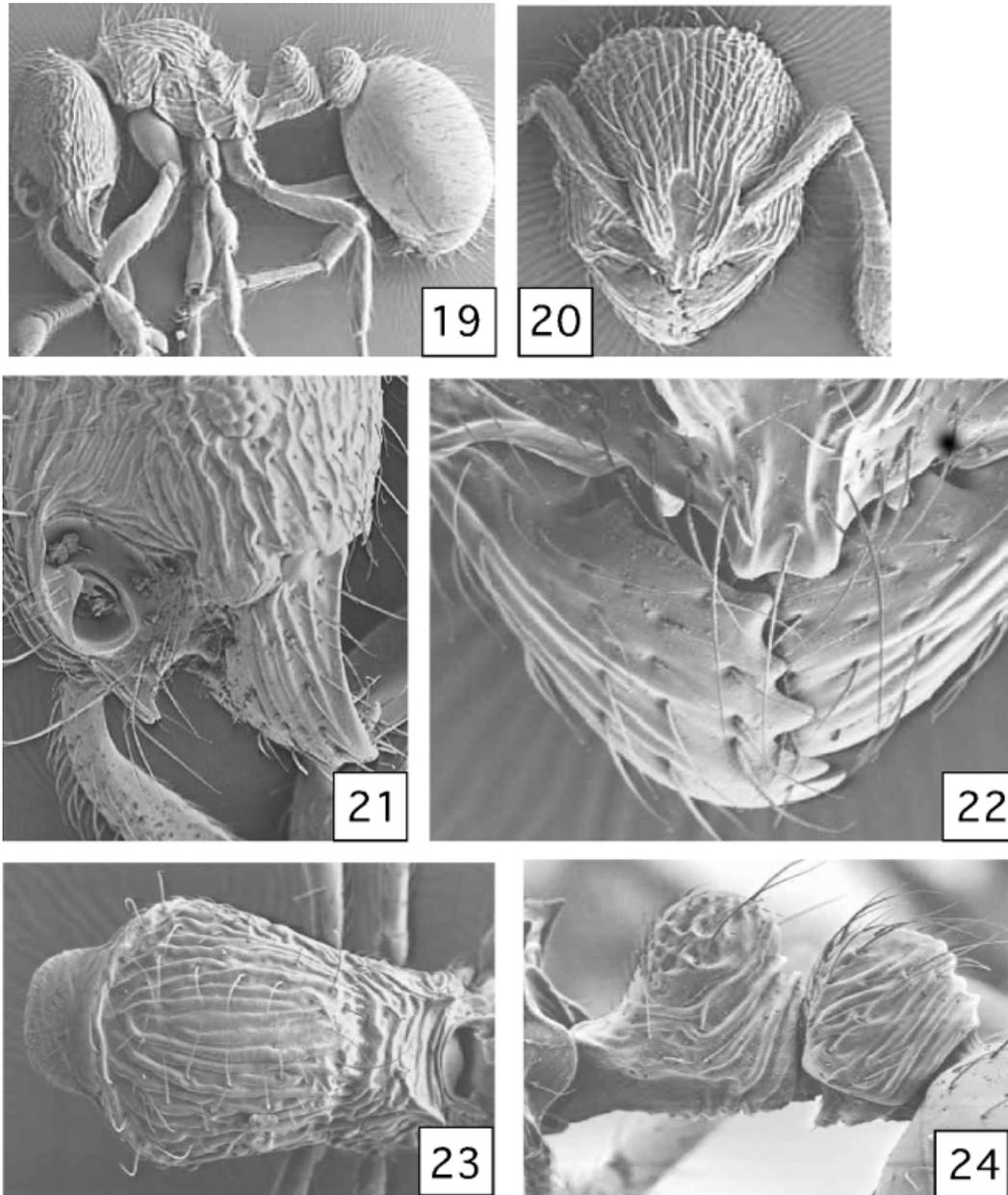




FIGURES 7–12: *Adelomyrmex myops* (worker). Fig. 7. Lateral view; Fig. 8. Head in full face view; Fig. 9. Clypeal plate showing the setation pattern; Fig. 10. Head in lateral view; Fig. 11. Mesosoma in dorsal view; Fig. 12. Petiole and postpetiole in lateral view.

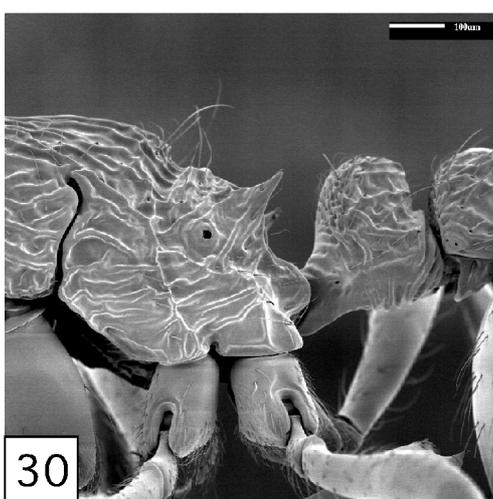
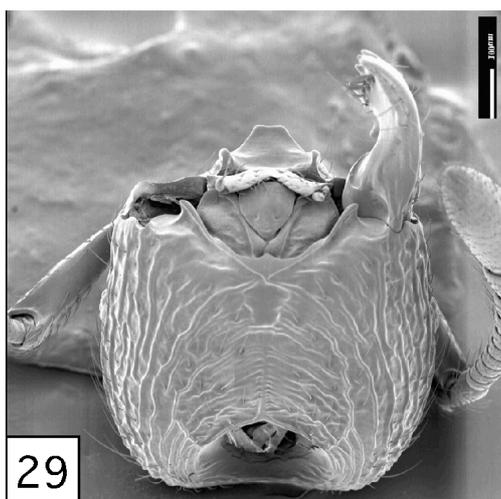
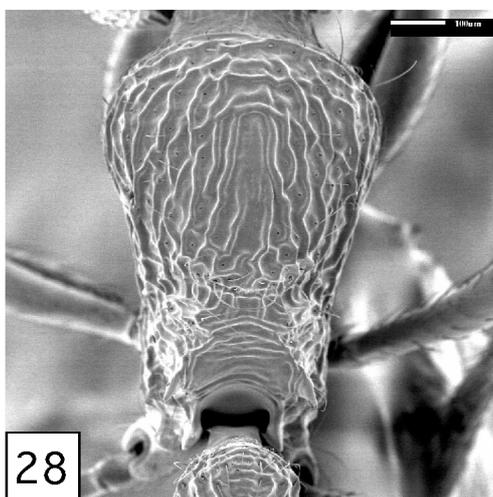
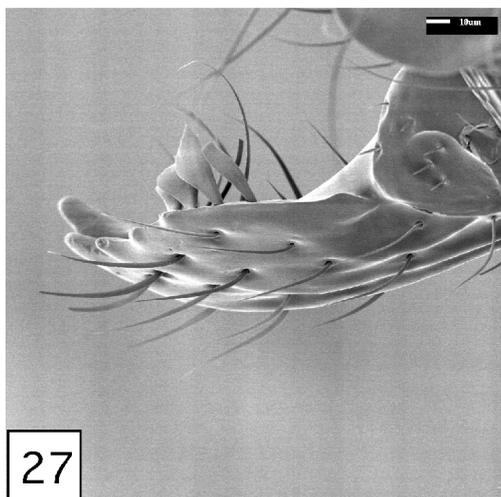
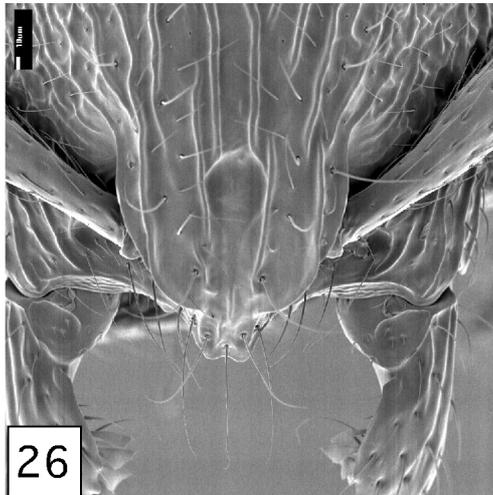
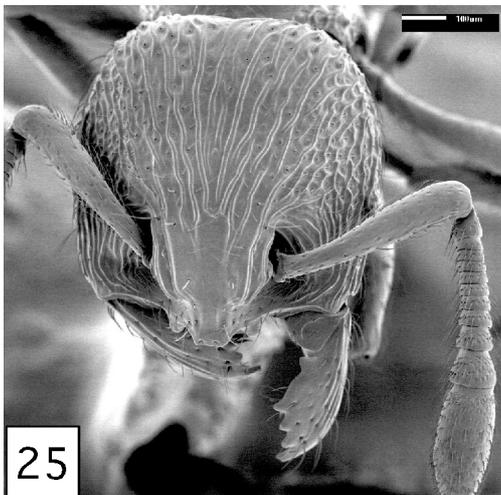


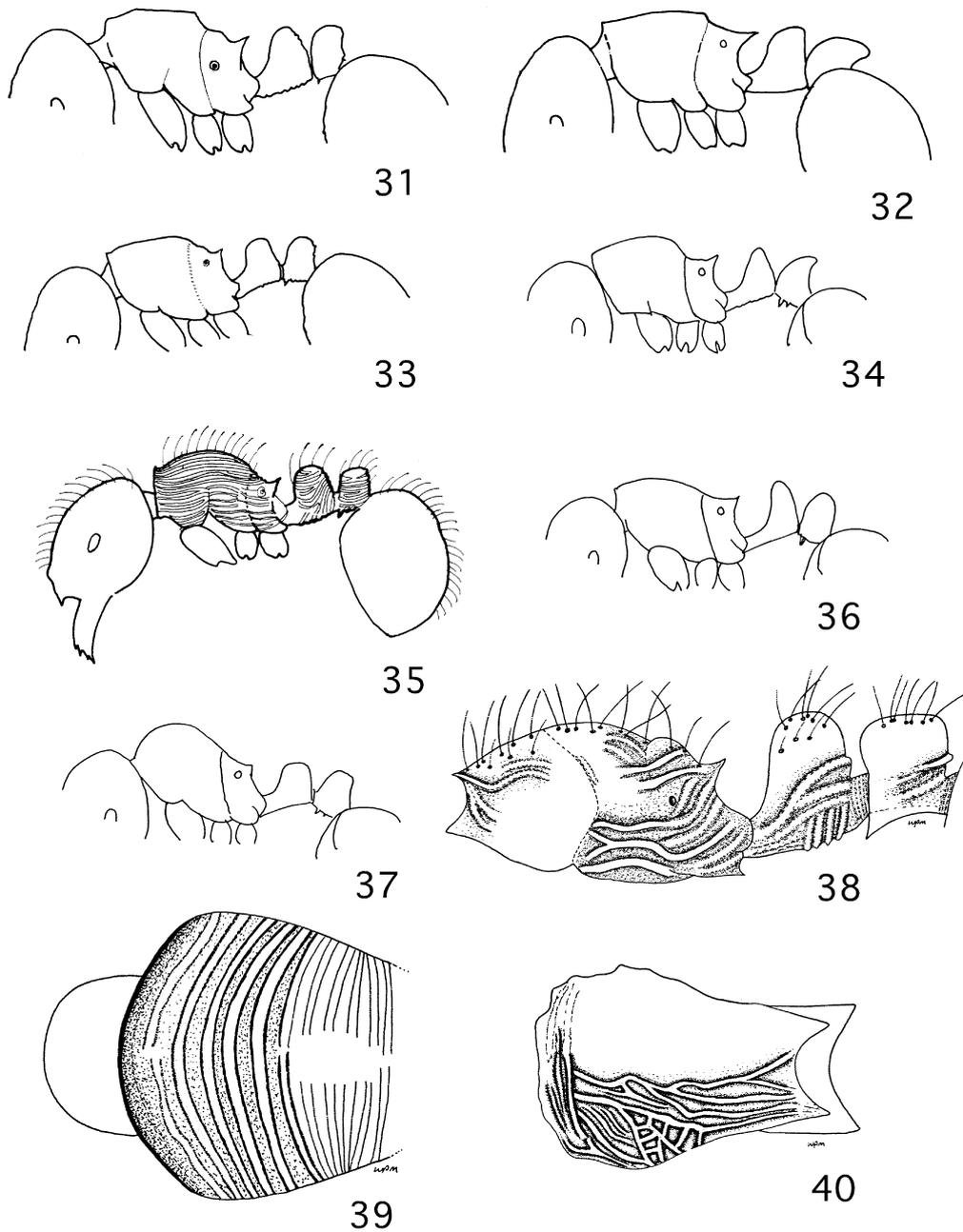
FIGURES 13–18: *Adelomyrmex sivistrii* (Worker). Fig. 13. Lateral view; Fig. 14. Head in full face view; Fig. 15. Head in lateral view; Fig. 16. Clypeal plate showing the setation pattern; Fig. 17. Mesosoma in dorsal view; Fig. 18. Propodeal spines, petiole and postpetiole in lateral view.



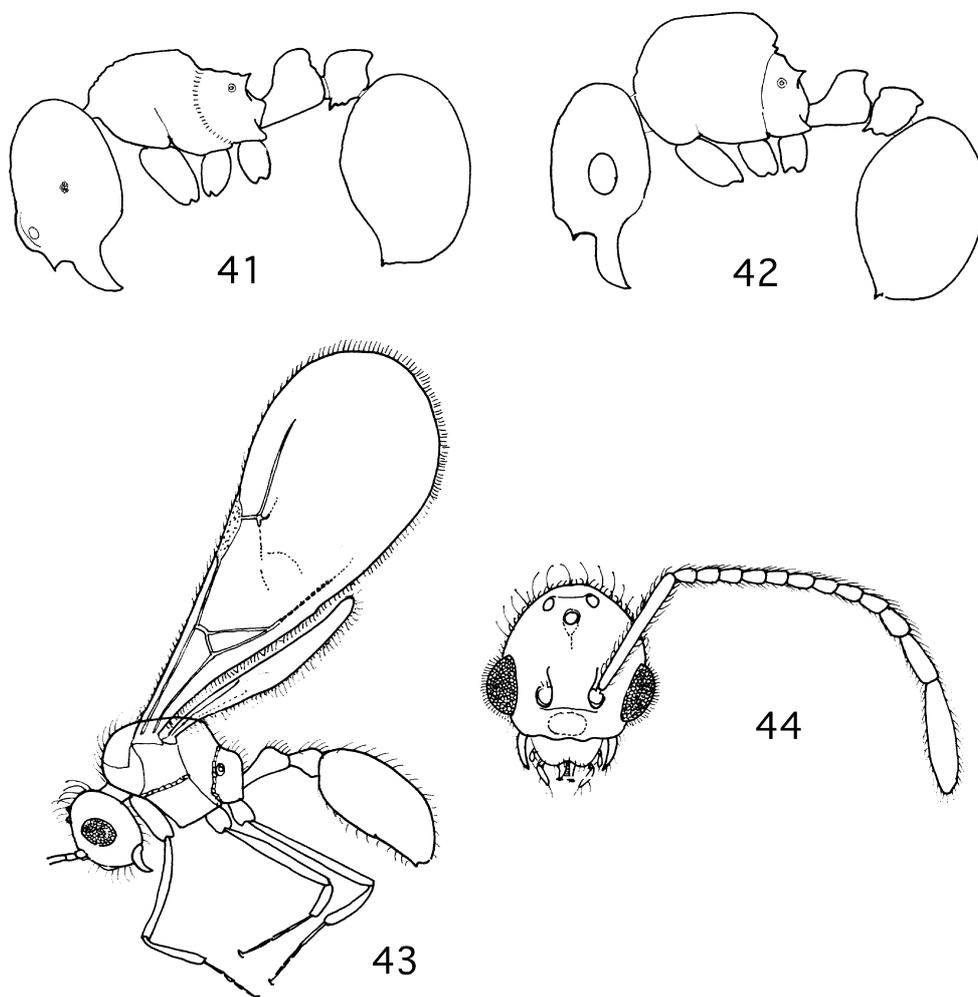
FIGURES 19–24: *Adelomyrmex tristani* (worker) Fig. 19. Lateral view; Fig. 20. Head in full face view; Fig. 21. Head in lateral view; Fig. 22. Clypeal plate showing the setation pattern; Fig. 23. Mesosoma in dorsal view; Fig. 24. Petiole and postpetiole in lateral view.

FIGURES 25–30: *Adelomyrmex robustus* (worker). Fig. 25. Head in full face view; Fig. 26. Head in full face view, showing clypeus; Fig. 27. Mandible in dorsal-oblique view showing modified setae; Fig. 28. Mesosoma in dorsal view; Fig. 29. Head in ventral view, showing the tiny hyposomal teeth; Fig. 30. Propodeum and petiole in lateral view.

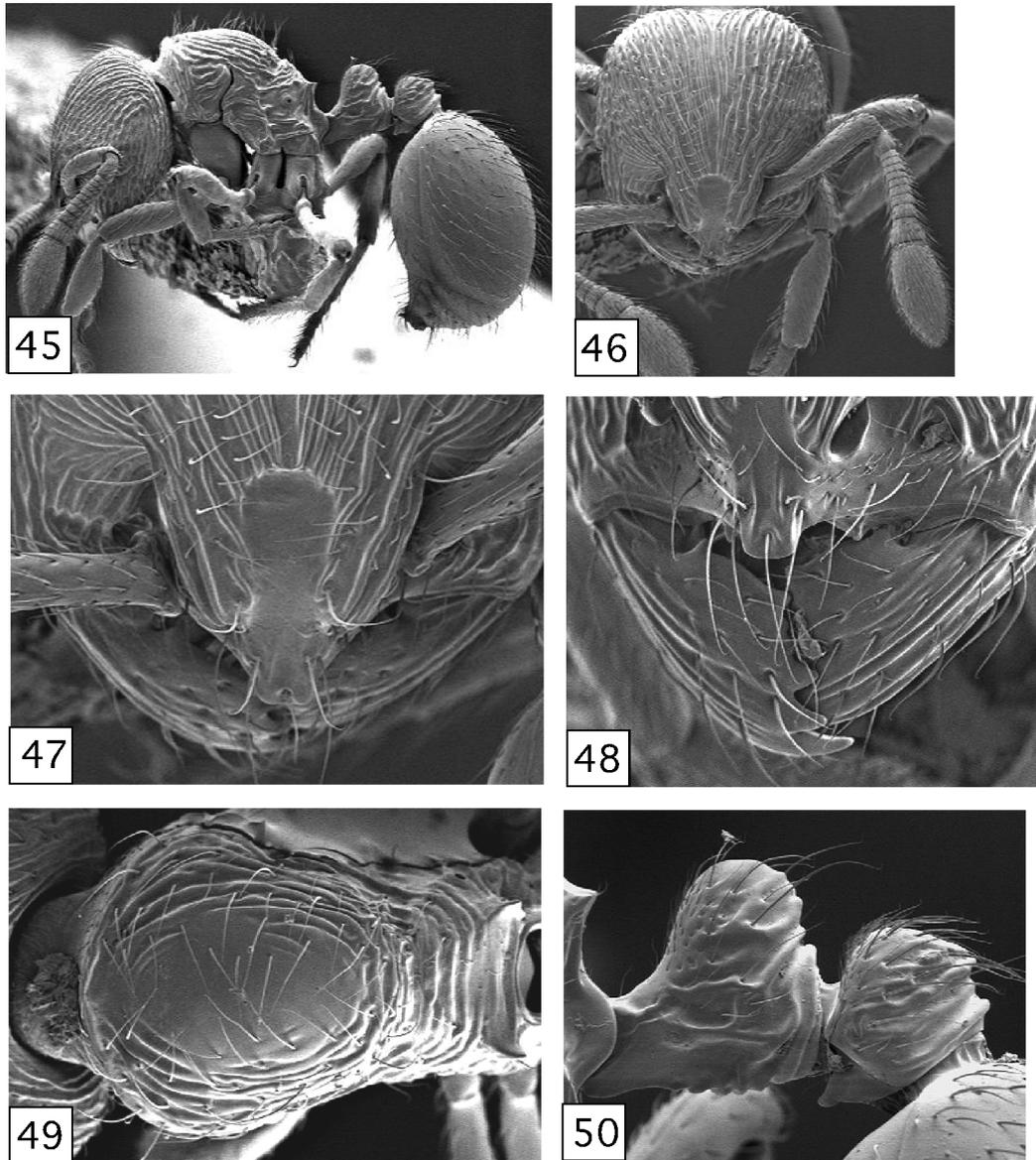




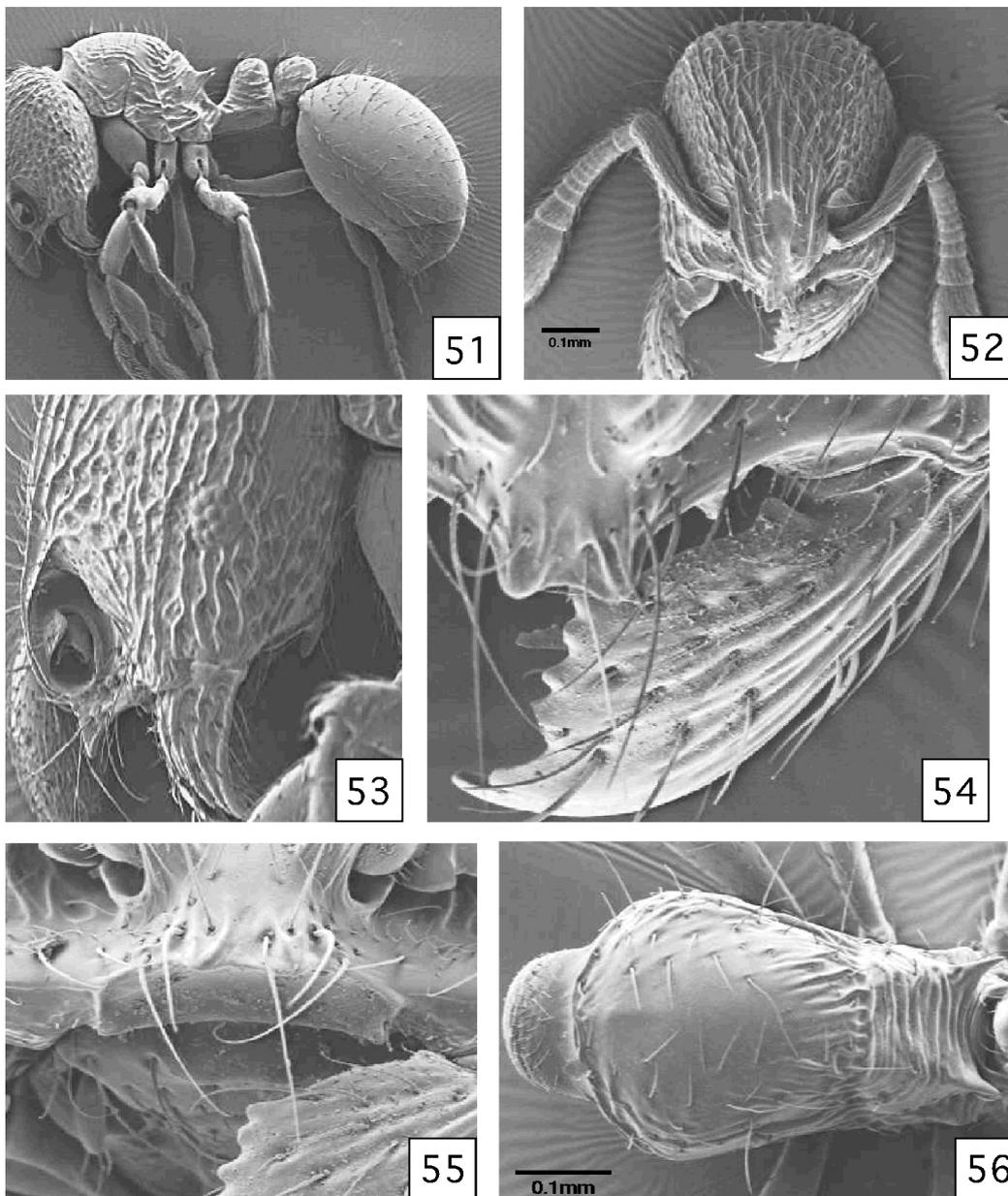
FIGURES 31–40. *Adelomyrmex* spp (workers). Lateral view of mesosoma of *A. myops* (Fig. 31), *A. silvestrii* (Fig. 32), *A. tristani* (Fig. 33), *A. grandis* (Fig. 34), *A. costatus* (Fig. 35), *A. cristiani* (Fig. 36), *A. striatus* (Fig. 37), *A. laevigatus* (Fig. 38). Figs. 39-40: Two sculpture variants in *A. tristani*, dorsal view of mesosoma.



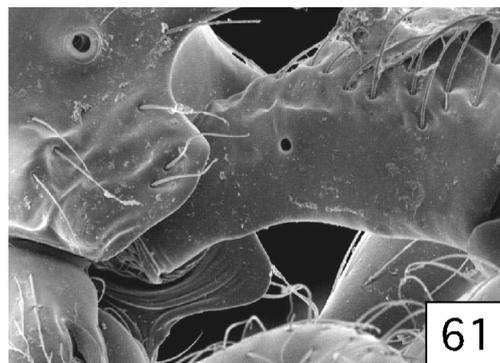
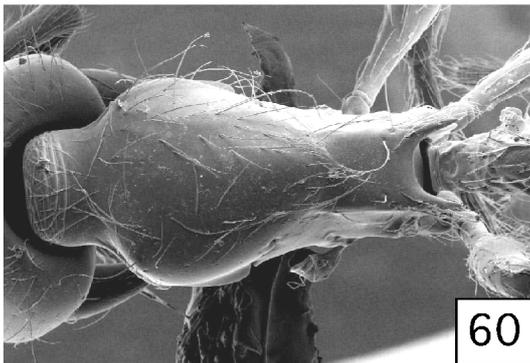
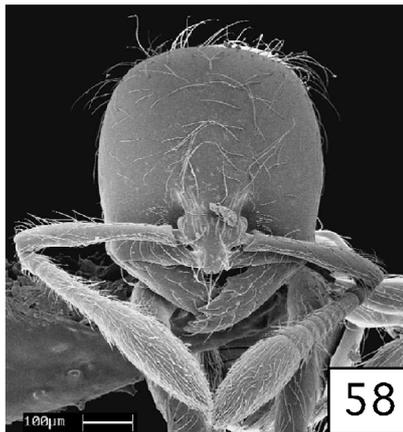
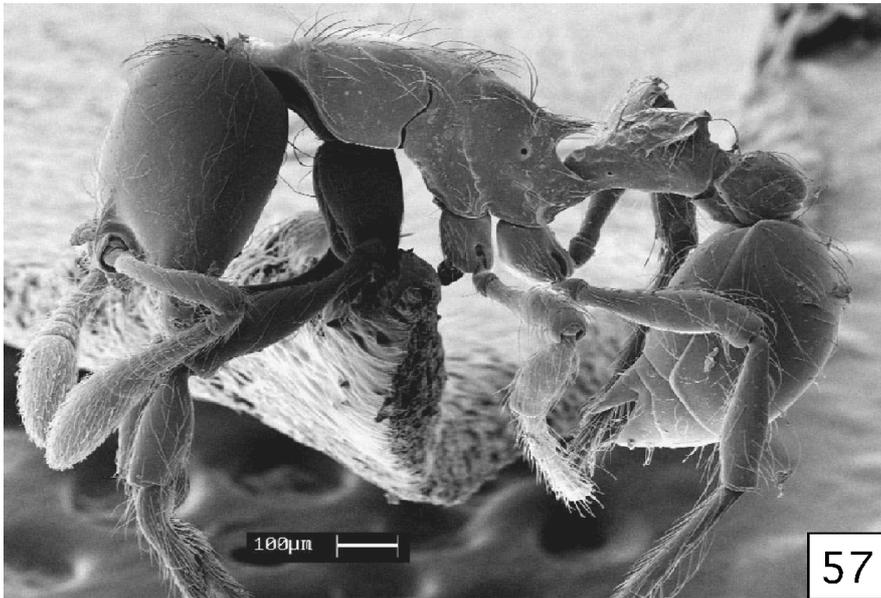
FIGURES 41–44: *Adelomyrmex vaderi*. Fig. 41. Lateral view of worker; Fig. 42. Lateral view of dealate queen; Fig. 43. Lateral view of male; Fig. 44. Full face view of male head.



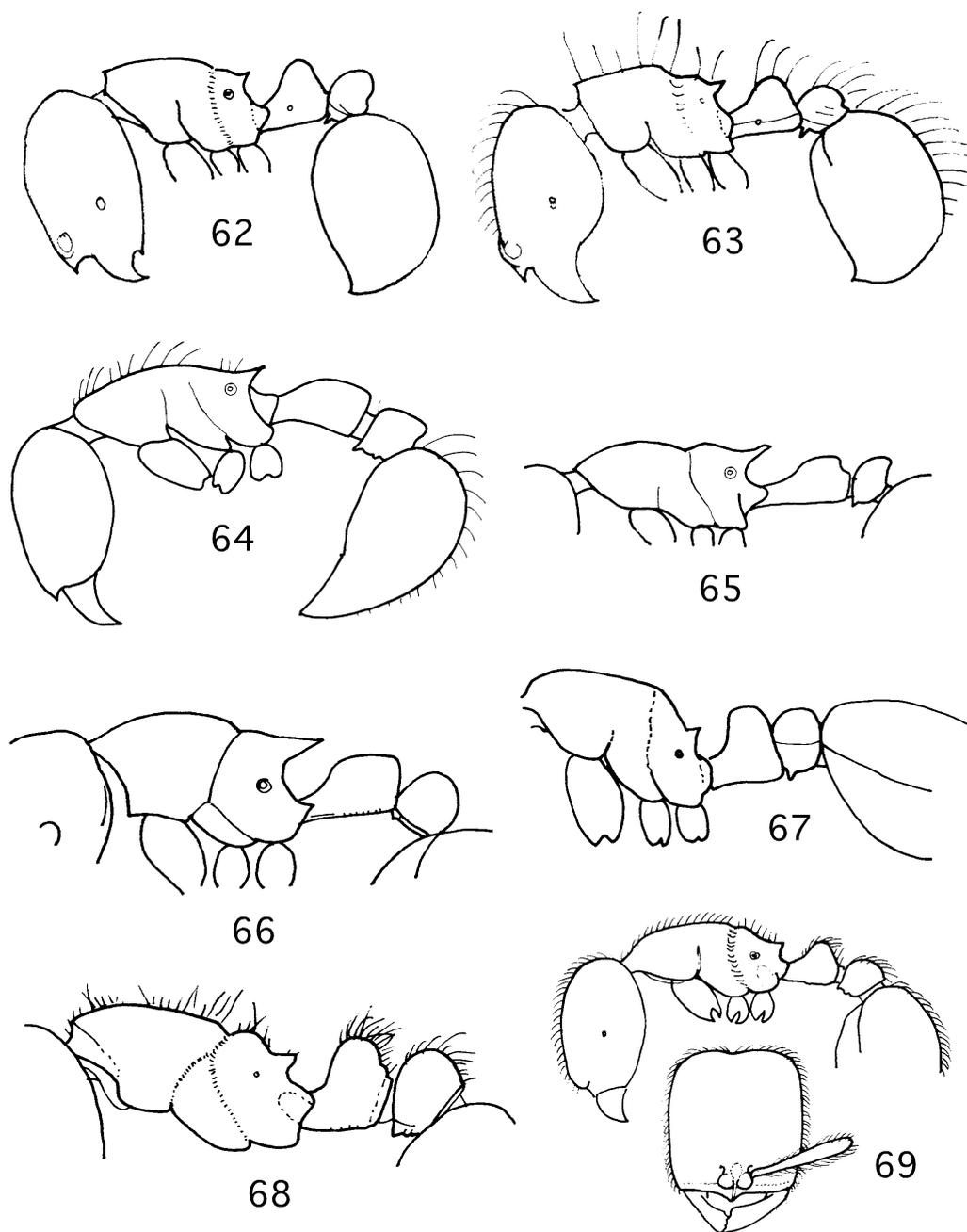
FIGURES 45–50: *Adelomyrmex brevispinosus*. Fig. 45. Lateral view; Fig. 46. Head in full face view; Fig. 47. Dorsal view of clypeus; Fig. 48. Dorsal oblique view of clypeus; Fig. 49. Mesosoma in dorsal view; Fig. 50. Petiole and postpetiole in lateral view.



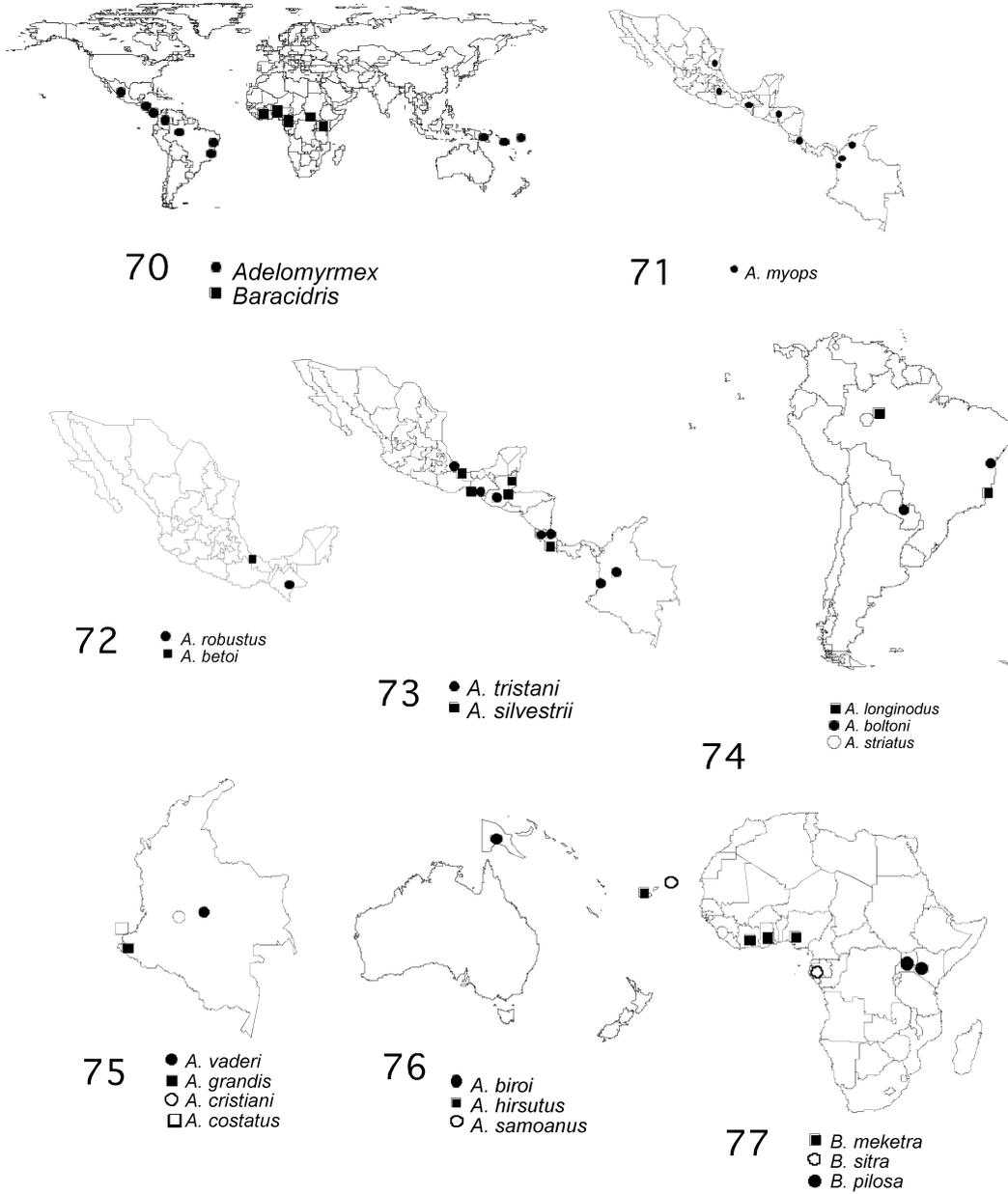
FIGURES 51–56: *Adelomyrmex laevigatus* (worker). Fig. 51. Lateral view; Fig. 52. Head in full face view; Fig. 53. Head in lateral view showing hypostomal tooth; Fig. 54. Dorsal view of clypeus (note the median seta displaced); Fig. 55. Detailed of clypeal concavity; Fig. 56. Dorsal view of mesosoma.



FIGURES 57–61: *Adelomyrmex longinodus*. Fig. 57. Lateral view; Fig. 58. Head in full face view; Fig. 59. Mouthparts; Fig. 60. Mesosoma in dorsal view; Fig. 61. Metapleural lobe and anterior portion of petiole in lateral view.



FIGURES 62–69: *Adelomyrmex* and *Baracidris* spp., lateral views of body or mesosoma. Fig. 62. *A. foveolatus*; Fig. 63 *A. microps*; Fig. 64 *A. longinodus*; Fig. 65 *A. boltoni*; Fig. 66 *A. biroi*; Fig. 67 *A. hirsutus* (redrawn from Mann, 1921); Fig. 68 *A. samoanus* (redrawn from Wilson & Taylor, 1967); Fig. 69 *Baracidris pilosa*, lateral view of body (up), head un full face view (bottom).



FIGURES 70–77. Distributive maps: *Adelomyrmex* genus group in the World (Fig. 70); *A. myops* in Mesoamerica and Colombia (Fig. 71); *A. robustus* & *A. betoi* in Mexico (Fig. 72); *A. tristani* & *A. silvestrii* in Mesoamerica and Colombia (Fig. 73); *A. longinodus*, *A. boltoni* and *A. striatus* in South America (Fig. 74); *A. vaderi*, *A. grandis*, *A. cristiani* & *A. costatus* in Colombia (Fig. 75); *A. biroi*, *A. hirsutus* & *A. samoanus* in Pacific Islands (Fig. 76); *B. meketra*, *B. sitra* and *B. pilosa* in Africa (Fig. 77).